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American Cinematographer

INTERNATIONAL JOURNAL OF FILM
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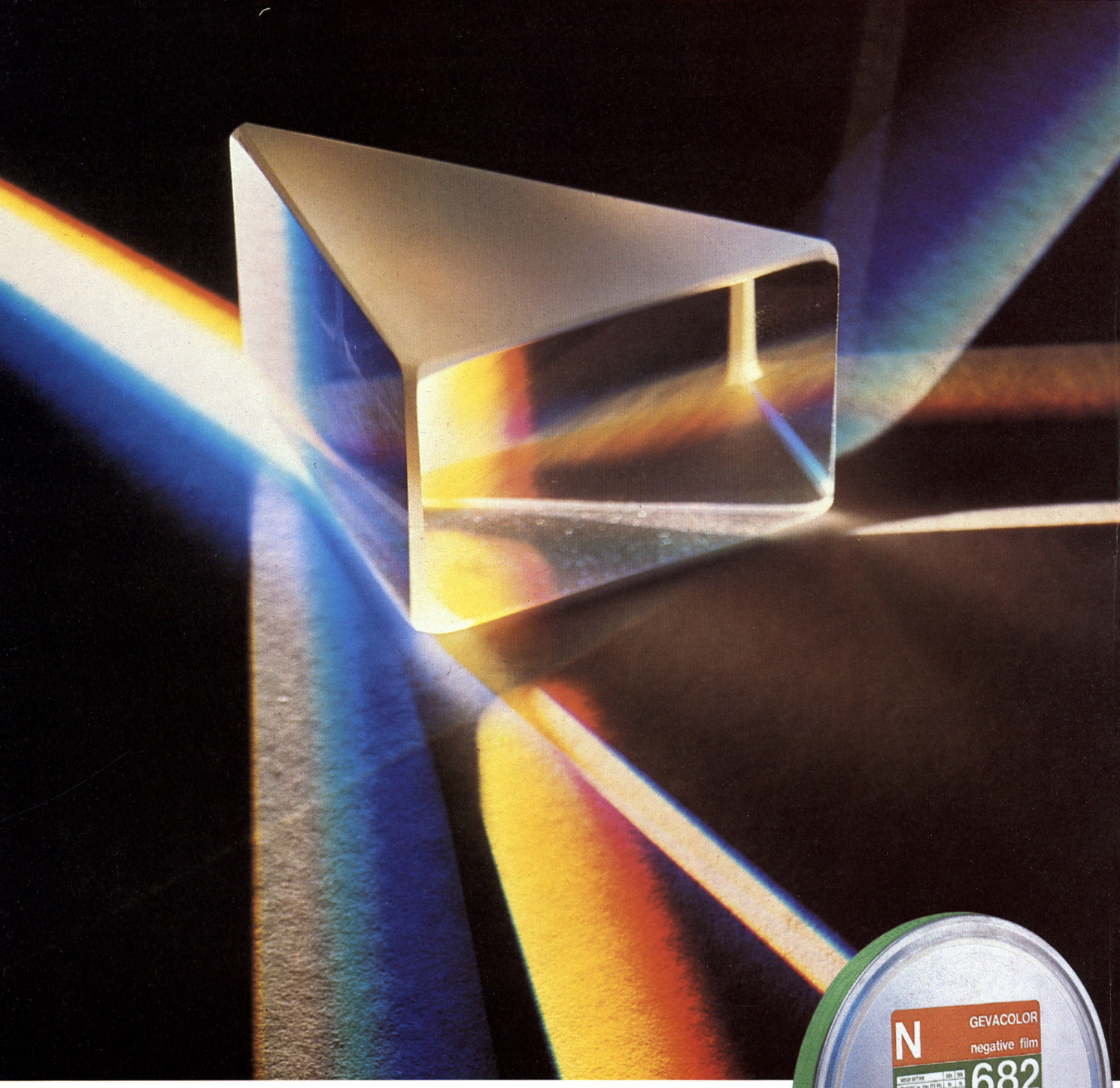
NOVEMBER 1982

SPECIAL LIGHTING ISSUE



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Editorial—Advertising—Business Offices
1782 North Orange Drive
Hollywood, Calif. 90028
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ON THE COVER

Frederic Forrest plays a fictionalized Dashiell Hammett in a classic detective film set in San Francisco in the Thirties. Cover photo by Morgan Renard of a scene lit by Joseph Biroc, A.S.C.

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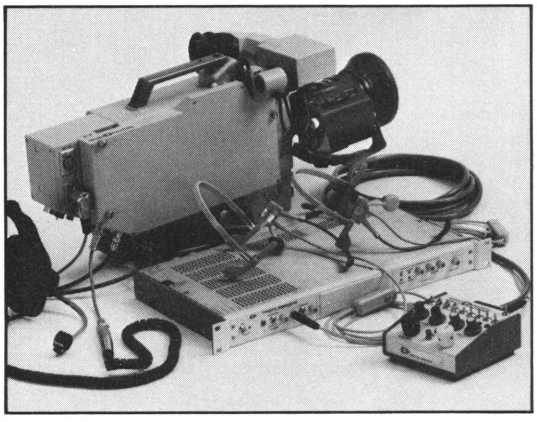

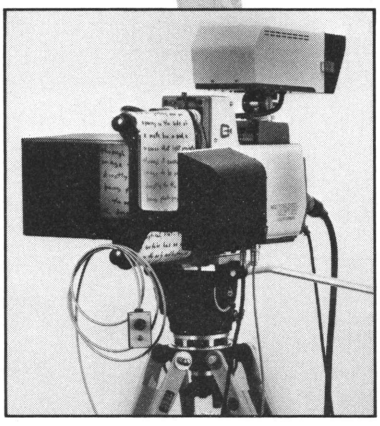

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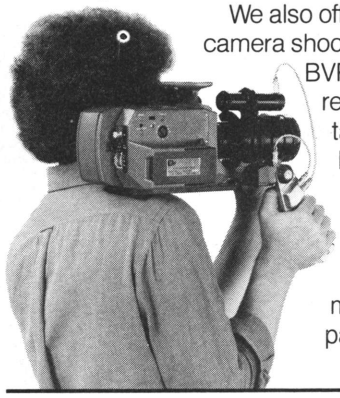

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FROM THE EDITOR

The art of lighting is the cornerstone of all film and video production. Obviously without light there would be no recordable image, but even more importantly without the artistic use of light the images recorded either on film or videotape lose much of their impact and perhaps all of their meaning. The same people in the same environment can result in a totally different image depending on how the scene is lit. Lighting effects can not only turn an artificial setting into something believable; they can infuse everyday reality with an otherworldly or spiritual presence. A face can be made attractive or frightening through the use of light. Light can dazzle, mystify, clarify, glamourize, transform and dramatize.

There is a tendency to assume that eventually high speed films or supersensitive pick-up devices will eliminate the need for artificial lighting. Some day a camera will be able to record whatever the eye sees just as the eye sees it. Some cameramen are in fact saying that the new Eastman negative can already record virtually anything the eye can see, but even the fastest film imaginable will never eliminate the need for lighting. Natural light may be beautiful in many instances and recording scenes just as the eye sees them may be adequate for many purposes, but the imagination is not to be limited by what is naturally available. The mind's eye sees far more than is visible in the natural world, and the only way to create images seen by the mind's eye is through "artificial" means. Artificial does not just mean fake or phony; it means literally made by art. Artificial lighting is the means by which a cinematographer creates his images. At its best cinematography is still and will always be "painting with light."

A lot of the anxiety with which some film cameramen view the "video revolution" stems not just from concerns about job security but from a concern that the art of lighting may be lost. Because video as a production medium has such strong associations with news and with multiple camera production, it is assumed that the medium itself is not suited to artistic lighting. Moreover because so many of the personnel in video production seem to be primarily technicians, it is assumed that there is no way for someone beginning a career in video camerawork to learn the art of lighting. Older cameramen who began their careers as assistants to the now legendary cameramen of Hollywood see a change taking place in the industry which may cause a break in the traditions of cinematography.

Photography was of course subject to a similar prejudice when it first began to develop as an art form. Painters often tended to dismiss photography as a slave to nature, merely a technical process with no potential for artistic expression. Photography proved them wrong and video is already demonstrating clearly its artistic potential. Nonetheless there is a tradition of lighting associated with film production which has yet to be fully assimilated into video production. When contemplating how AMERICAN CINEMATOGRAPHER should embrace the video revolution, one of the first things that occurred to us (aside from trying to make talk about bandwidth and user bits accessible to film craftsmen) was the idea that the traditions of film lighting styles and techniques needed to be made more accessible to video production personnel. This issue represents our first concerted effort in that direction.

Some of our readers apparently assume that Hollywood cameramen have secret lighting techniques which enable them to get the results we see on the screen. The truth of the matter is quite the opposite. There are no secrets. There is just the skill that comes from years of experience and in most cases of apprenticeship with other cameramen.

—RICHARD PATTERSON

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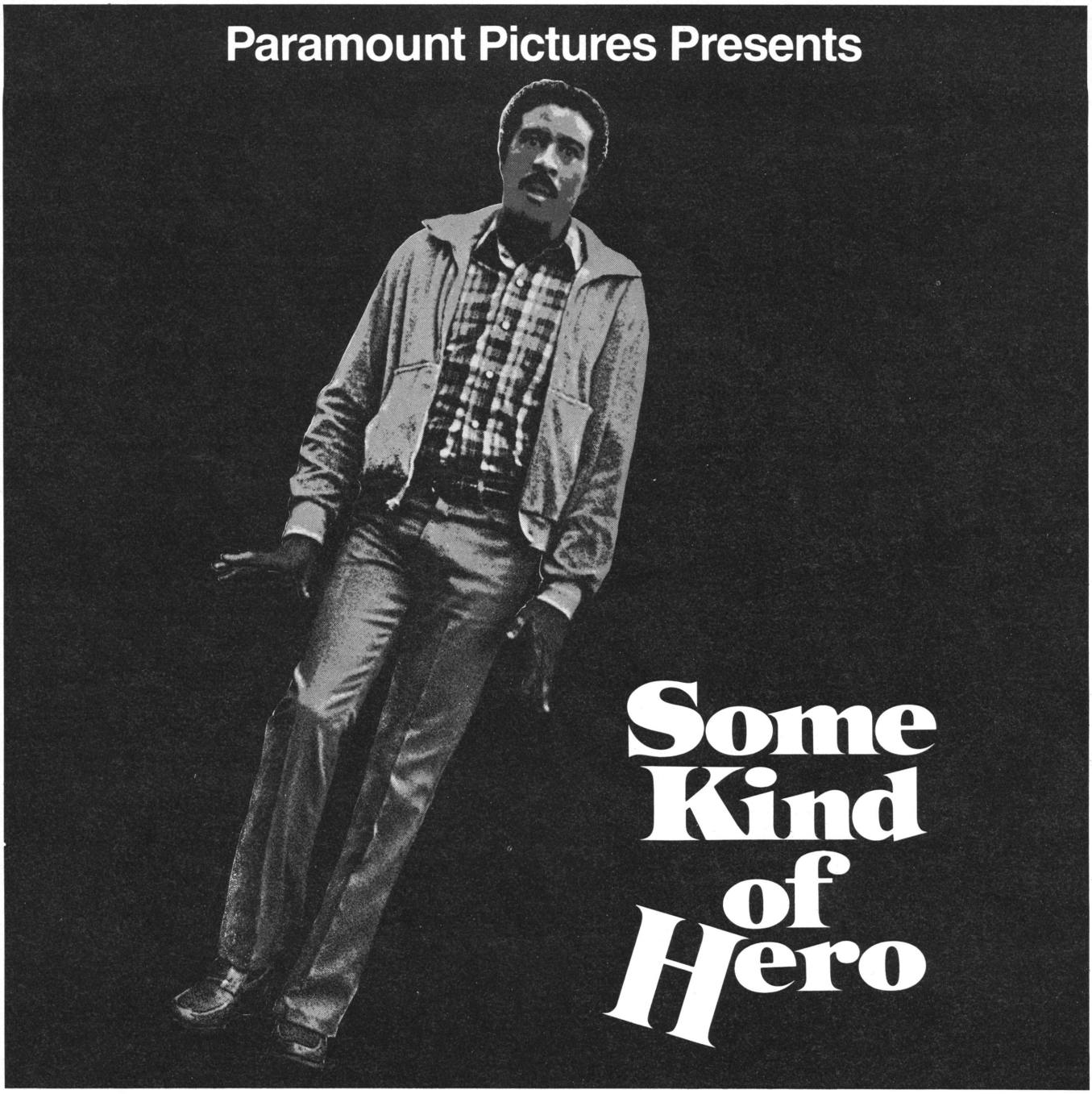

Let's hear it for the cinematographer- King Baggot

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LETTERS

More Blues

As a school of photography we are very interested in obtaining blue screen material but have had no luck with the various local firms. I would be very pleased if you could recommend a supplier that would export some of this material to us.

V.D. Wait
Technikon Natal
Durban, South Africa

Stewart T-Matte Blue Screen material is available from Stewart Filmscreen Corporation, 1161 West Sepulveda Boulevard, Torrance, California 90502 telephone: (213) 326-1422. Joseph Westheimer, ASC, also suggests the use of a special paint for areas where the screen material is not feasible. In addition to the Mann Brothers paint mentioned in the last month's column, there is DCU Blue Matte Finish Scenic Infinity Paint #SC-71-3-60, a water base paint available from 7-K Color Corporation, 927 Citrus Avenue, Hollywood, California 90038, telephone: (213) 464-0566.

Video Classes

In reply to Douglas T. Polk's letter in the September '82 issue, might I suggest to him and any other readers who are interested in the basics of video to consider calling their local cable companies and inquiring about local access to video classes. In my area the local cable franchises, in order to keep rights to a specific franchise area, must provide the public with classes in video production and technique. It's worth checking out and usually the classes are free. The best thing about them is they are geared to the non-video public.

Thanks for finally recognizing the "other" media and keep up the good work. I especially find David Samuelson's "Talking Technically" a great help.

Mary Dale Amison
Group W Cable
St. Louis, MO

But Then Again

In my opinion AMERICAN CINEMATOGRAPHER should stick to the elements of filmmaking and leave the video revolution to the video trade journals and new magazines starting up. I am worried that this fine magazine could end up hard pressed for space for articles concerning FILM. Please consider those of us who enjoy video for what it's worth, but choose to remain with celluloid as our medium.

John Graziano
Santa Monica, CA

More On Gunga Din

In the late Forties a number of longer RKO pictures were shortened for reissue on double bills. Twenty-two minutes were removed from GUNGA DIN. Like the famous deletions in KING KONG these trims were made in both the original negative and nitrate protection masters, meaning that all subsequent 35mm safety and 16mm prints were of the shortened version. A complete fine-grain of GUNGA DIN was discovered in England, which also included the Kipling scenes. (There is an additional shot showing Kipling riding with Montagu Love to the final battle.) The Nostalgia Merchant, which licensed Super-8 and video rights to various RKO films got pre-print material on this complete version but ultimately decided not to release it in Super-8. The complete version is available on video.

R. Mitchell
Hollywood, CA

SCRIMS
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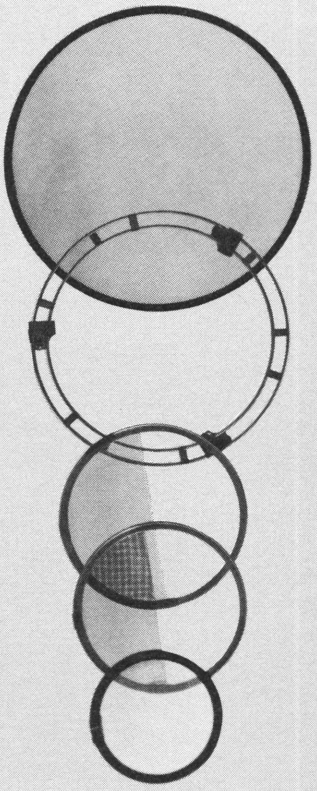

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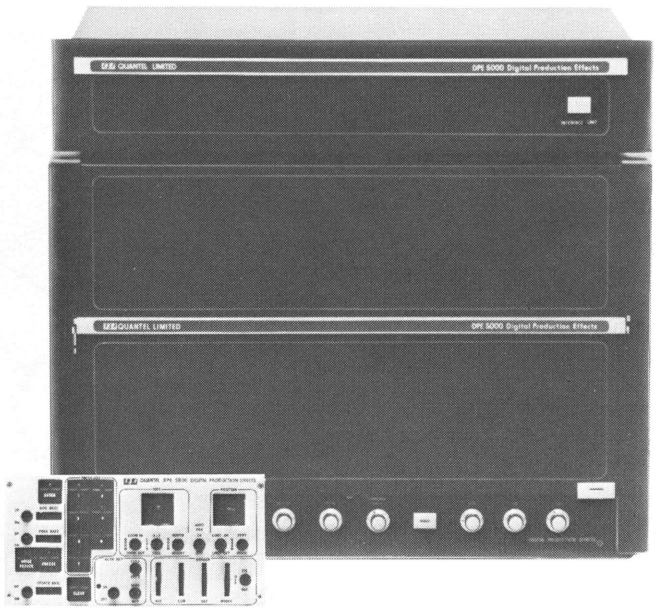

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THE BOOKSHELF

by GEORGE L. GEORGE

GENRES AND TECHNIQUES

Lenny Lipton's FOUNDATIONS OF STEREOSCOPIC CINEMA is a comprehensive survey of all previous research on the subject. It outlines the results of his own work in the newly revived 3-D field. Lipton's theoretical concepts have proven themselves in practice, providing specifications useful to optical engineers, equipment designers and filmmakers (Van Nostrand Reinhold $21.95).

The genesis of such classics as *The Cabinet of Dr. Caligari* and *Nosferatu* are traced by John D. Barlow in GERMAN EXPRESSIONIST FILM, an informative study of a genre that reshaped radically the visual and thematic aspects of motion pictures in the 20s, and deeply affected succeeding generations of filmmakers (J.K. Hall $16.95). The presence of expressionistic influences in surrealist films is detected by Linda Williams in FIGURES OF DESIRE, a psychoanalytical approach to the genre based on her assessment of films by Luis Bunuel (U. of Illinois Press $21.50).

Since the early days of the movies, Jews have been active in films, both behind the scenes and on screen. Lester D. Friedman's study, HOLLYWOOD'S IMAGE OF THE JEW, explores the chronological evolution of Jews' image in films and the profound impact on American society of this ethnic minority in its midst (Ungar $14.95/8.95).

Popular film genres are surveyed in two recent books: KEEP WATCHING THE SKIES! by Bill Warren, dealing with American science fiction movies of the 50s, and THE J. D. FILMS by Mark T. McGee and Ronald J. Robertson, examining juvenile delinquency portrayal on screen. The former lists and describes 133 s.f. films with extensive plot summaries and full credit lists; the latter discusses j.d. movies in the context of social realities (McFarland, Box 611, Jefferson, NC 28640; $39.95 and 15.95 resp.)

In WESTERN FILMS, Brian Garfield discusses extensively over 2,000 "oaters," an informative and enter-

taining survey tracing the genre's evolution from romantic fable to realistic chronicle (Scribners $24.95).

THE REFERENCE SHELF

Compiled by the Academy of Motion Picture Arts and Sciences, the 1981 ANNUAL INDEX TO MOTION PICTURE CREDITS is an exhaustive record of films shown that year in the Los Angeles area, the basis for Academy Awards eligibility. This authoritative reference volume includes all pertinent data on production, distribution, as well as craft and creative personnel (Greenwood $150).

Expert makeup artist Lee Baygan has written two books on the creative aspects and practical requirements of his profession. MAKEUP FOR THEATRE, FILM AND TELEVISION is a photographic guide that demonstrates makeup techniques in a variety of situations (Drama Books $29.95). In TECHNIQUES OF THREE-DIMENSIONAL MAKEUP, effective methods of prosthetic makeup are shown for altering radically the appearance of performers in such films as *Star Wars* and *The Godfather* (Watson-Guptill $24.95).

In two volumes, SELECTED FILM CRITICISM 1912–1920 and 1921–1930, Anthony Slide reprints representative reviews of some 400 important movies, culled from trade journals of the period. This significant contribution to the study of cinema affords an appreciation by contemporary critics of films by Chaplin, Griffith, de Mille and Clarence Brown (Scarecrow $18.50 ea.).

Composer Irwin Bazelon, in KNOWING THE SCORE, provides an analysis of film music based on personal experience and interviews with fellow composers. His stimulating, fact-filled book stresses the need for increased awareness of music's role in movies and effective communication between composer and filmmaker (Arco $9.95).

THE SCREENWRITER'S CRAFT

Toni Stempel's SCREENWRITING is an effective manual describing the scripting process from the idea stage to marketing the finished work (A.S. Barnes $9.95). In THE SCREENWRITERS GUIDE 1982–83, Keith Burr and Joseph Gillis provide a succinct list of the craft's do's and dont's, followed by a useful directory of over 2,000 producers and agents (NY Zoetrope $7.95).

Directors Michael Cimmino, George Seaton, Ken Russell; actors Anthony Newley, Martin Mull; writers Steve Tesich, Peter Brooks appear in CONTEMPORARY AUTHORS (Vol. 105) among some 1400 biographical sketches and interviews of distinguished literary personalities (Gale $72). In INTERNATIONAL MOTION PICTURE BIBLIOGRAPHY 1979–80, H.P. Manz, with an assist from Klaus Denicke, lists and describes all books dealing with film published in the US and Western Europe—an invaluable reference work (NY Zoetrope $29.95).

Two newly published screenplays feature the films' visual qualities rather than their text. TEMPEST, directed by Paul Mazursky, consists mainly of dramatic stills culled from cameraman Don McAlpine's impressive work, with a narrative by Geoffrey Taylor (NY Zoetrope $10.95). In PINK FLOYD THE WALL, British cinematographer Peter Biziou contributes a series of shots in an extraordinary variety of moods ranging from the realistic to the delirious, illustrating song lyrics in this Alan Parker rock movie (Avon $9.95).

Visual screenplays of two French films, BILITIS and TENDER COUSINS, written, directed and photographed by David Hamilton, reveal his delicate talent for sensuous romanticism. Graceful images of young bodies in innocently erotic poses and dreamlike landscapes in soft colors underline the languid tone of the commentary (Morrow $12.95 ea.).

In SCREENPLAYS, German director Werner Herzog collects the scripts of his unconventional films, *Aguirre the Wrath of God, Everyman for Himself and God Against All* and *Land of Silence and Darkness,* all three powerfully expressing concern for man's fate. Equally impressive is the photography, conceived by Herzog and brilliantly executed by Thomas Mauch and Jorg Schmidt-Reitwein (Tanam Press, 40 White St., NYC 10013; $11.95/5.95).

The screenplay by Howard Koch and Seton I. Miller for Michael Curtiz's 1940 epic THE SEA HAWK, with Sol Polito's superb b&w photography, is published in the continuing Wisconsin/WB screenplay series, knowledgeably annotated by Rudy Behlmer (U. of Wisconsin Press $17.50/6.95). ■

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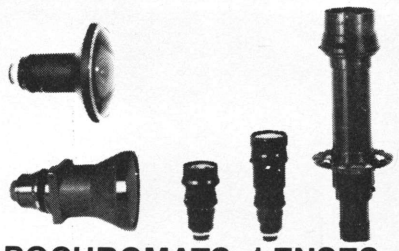

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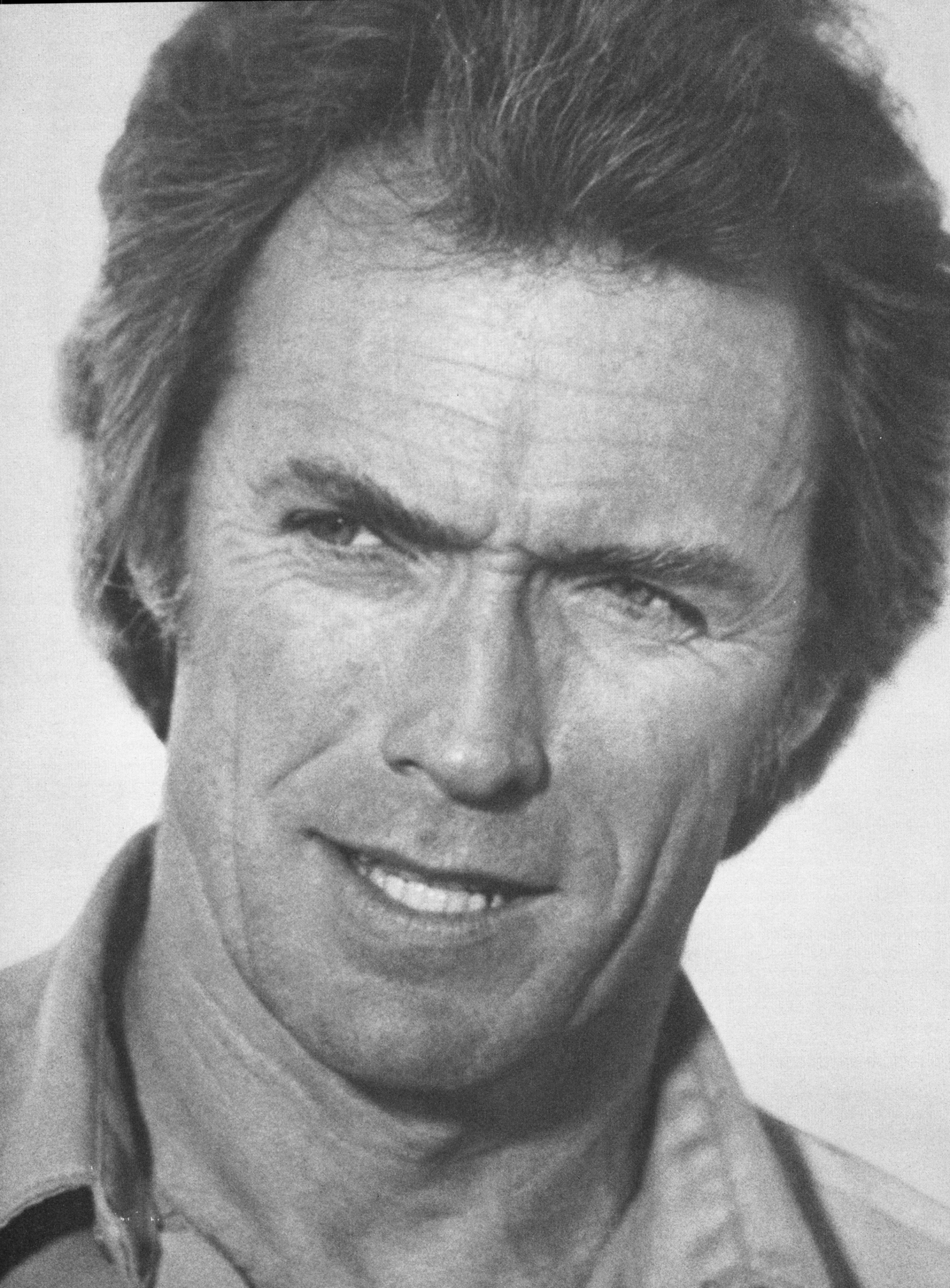

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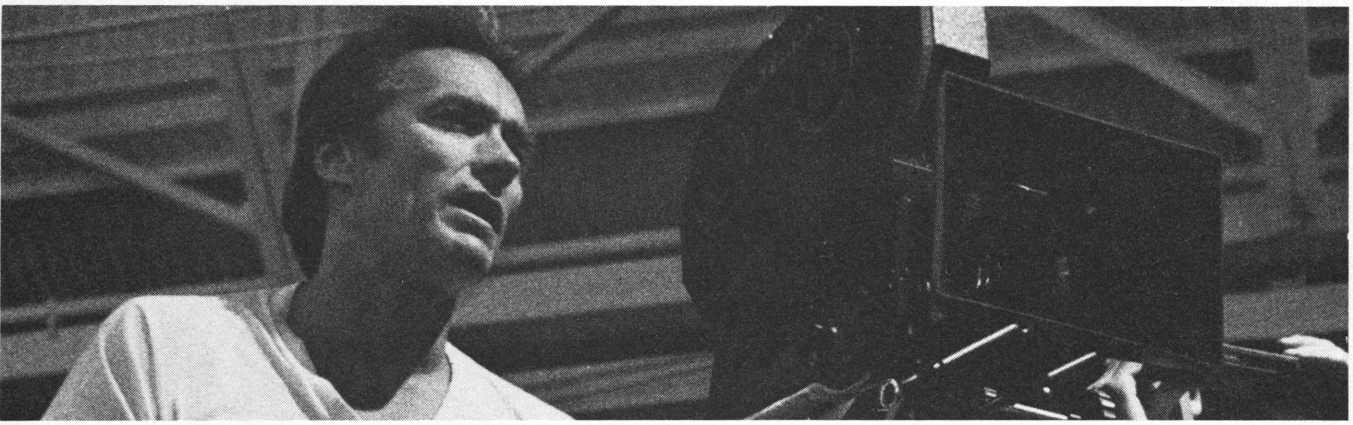

"Directing is knowing the concept you want and getting it."

As an actor, Clint Eastwood has proven to be the fastest draw in the Western box office. His films of the last ten years have grossed $1.4 billion, and he has been named "Star of the Decade." But much of his energy goes into his own production company, Malpaso Productions. He is unique in turning scant budgets ($3.5 million for Every Which Way But Loose*) into extremely high returns (over $87 million for that same picture). He has directed eight features, including* The Outlaw Josey Wales *and* Bronco Billy.

"I shoot fast. The first feature I ever directed—*Play Misty for Me*—was wrapped in a little over five weeks. *Breezy* was completed in less than five weeks. It's not just a matter of money. I like to have momentum, to keep the spirit and energy going. To me, directing is knowing the concept you want and getting it.

"Shooting on location is easier, because a crew gets wrapped-up in the spirit of the film. I cast my crews as carefully as I cast my actors. That's why we have such happy, democratic crews. And we move—I try not to keep people on location too long.

"A director should change camera angles a lot. My theory is, when you're looking at a film, you're looking at a flat piece projected onto a flat surface. The only way you can approach a 3-D feeling is to cross over and get the camera right in there. So the audience can feel a part of a group rather than just observers *of* a group. Camera work is a lot like penmanship. The way you film a film says as much as the way it's written.

"Casting is one of the most important aspects in making a film. A film can live or die on it. The cast has to bring those characters to life. If you miscast a character, or one stands out wrong, you can throw the whole picture out of whack. It's like having a pebble in your tire.

"People say I know just what the public wants. I don't think the people themselves know what they want until they see it or hear about it. One should judge a property simply by whether or not one would like to go see it. There's a lot of gut instinct going when buying or rejecting a property.

"A lot of critics thought *Dirty Harry* was sort of a right wing film. It wasn't at all. It portrayed the circumstances that one guy was put into, and showed the frustration with our courts and our judicial system. Which is all very timely even today. The film was just ahead of itself. I try to say something different in every film, and this one is about that frustration. *Play Misty for Me* was a little statement on commitment and misinterpreting commitment in men and women. There is no 'Clint Eastwood message.' There are lots of different messages.

"I also try to find a look for each of my films. In *High Plains Drifter* the Mono Lake location, the mirage effect, the telephoto lens work, and especially the scorched, almost flaming look, all contributed to what I was trying to say. The last was achieved with an Eastman color negative film, which gave me the really black blacks I wanted without pushing the film at all.

"For my latest picture, *Firefox,* we used the new Eastman color high-speed negative film 5293. We must have been among the first to use it in a feature. We were doing a lot of front-screen projection versus live action. We were also getting a lot of deflection. We figured the new high-speed film would save time and lighting, and we were right. We used very little supplemental lighting and got great definition. The scenes also intercut very well with the rest of the footage. It was the right film for the problem."

If you would like to receive our monthly publication about filmmakers, KODAK Professional Forum, *write Eastman Kodak Company, Dept. 640, 343 State Street, Rochester, New York 14650.*

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TALKING TECHNICALLY

By DAVID W. SAMUELSON

ULTRA HIGH SPEED CAMERAS

During a recent visit to Los Angeles I had an opportunity to visit the Photo-Sonics factory and to see some of the remarkable specialist high speed film cameras made by that company. Those of us who are deeply involved in making films principally for theatre and television release tend to think in terms of 100–120 fps being the top speed for 'normal' 35mm cinematography and 500 fps for 16mm, with a few 360 fps intermittent and 2080–3250 fps rotary prism cameras available to the special effects specialists.

As one who knows the Photo-Sonics 360 fps 4E intermittent and 2000–3000+ fps rotary prism 4B cameras well it came as a source of pleasure to see some of their other exotic cameras such as the 70mm–10B 70mm intermittent camera which runs at 125 fps, pulling down a 10 hole 2½ inch square frame. Its sister camera, the 70mm–10B 70mm rotary prism camera shoots 360 2¼in sq. frames per second. If that isn't fast enough it can easily be converted to a half size frame and run at 720 fps. It draws up to 90 amps of current while getting up to speed and at 84 feet of film per second (nearly 60 miles per hour) runs through a 1000 ft. roll of 70mm film in about 12 seconds.

Lest anyone in film production think they can use these cameras to cut in with regular 70mm feature film negative I have a disappointment for them. The 70mm film used in these cameras, which are mainly for missile research, really is 70mm wide and has the old Type 1 0.234″ perforations pitch which was originally developed for the Grandeur format in 1929. The 70mm theatrical cameras, on the other hand, use 65mm film with a 0.187″ perforation pitch.

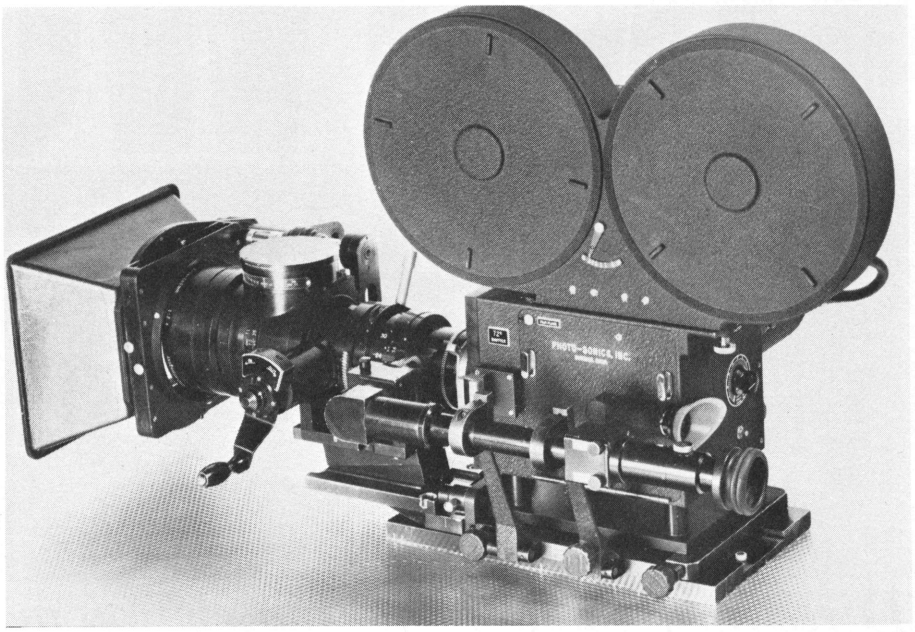
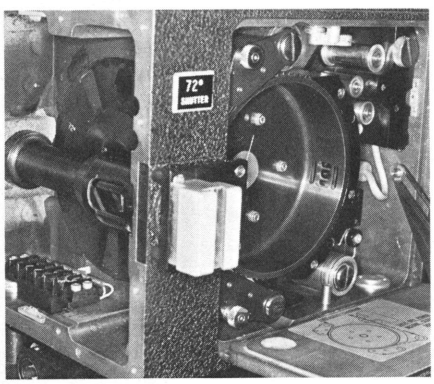


Photo-Sonics 4B with Angenieux 10 x 24 zoom lens.

For 16mm cinematography there is a 1000 fps intermittent camera, the 16–1W. When you think about it, that's a lot of stops and starts per second. After each exposure the film must accelerate at 16,000 G to get into place for the next one, and that's very fast. As a piece of engineering I never cease to admire the intermittent movement of the 35mm–4E. To achieve 360 fps and double exposure standard image steadiness it has 12 pulldown claws, 4 register pins, a vacuum back and runs so freely you can turn it with your little finger.

On all these ultra high speed intermittent cameras (the 16mm–1W, the 35mm–4E and the 70mm–10R) there are four pulldown arms (which in the case of the 1W incorporate two pulldown claws each and of the 4E and 10R, three claws each) which are machined out of a special type of high strength aluminium and pierced with so many holes to lighten them that they almost become a series of holes held together by a framework. Each pulldown claw is hard chrome plated and the four register pins located in the four corners of the frame hold the film steady to within 0.0005″ between frames. The vacuum back, which forms the back pressure plate, is drilled and grooved and connected to



Rotary prism, shutter and film compartment for 4B.

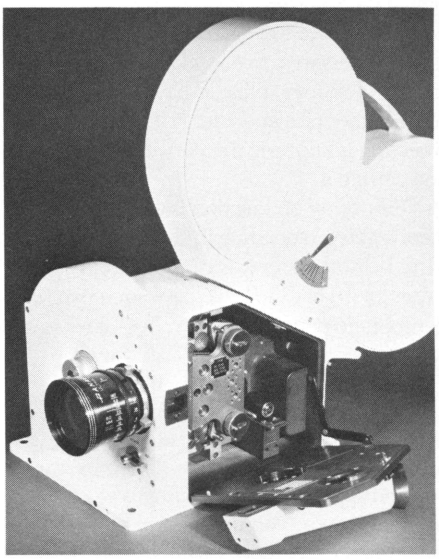
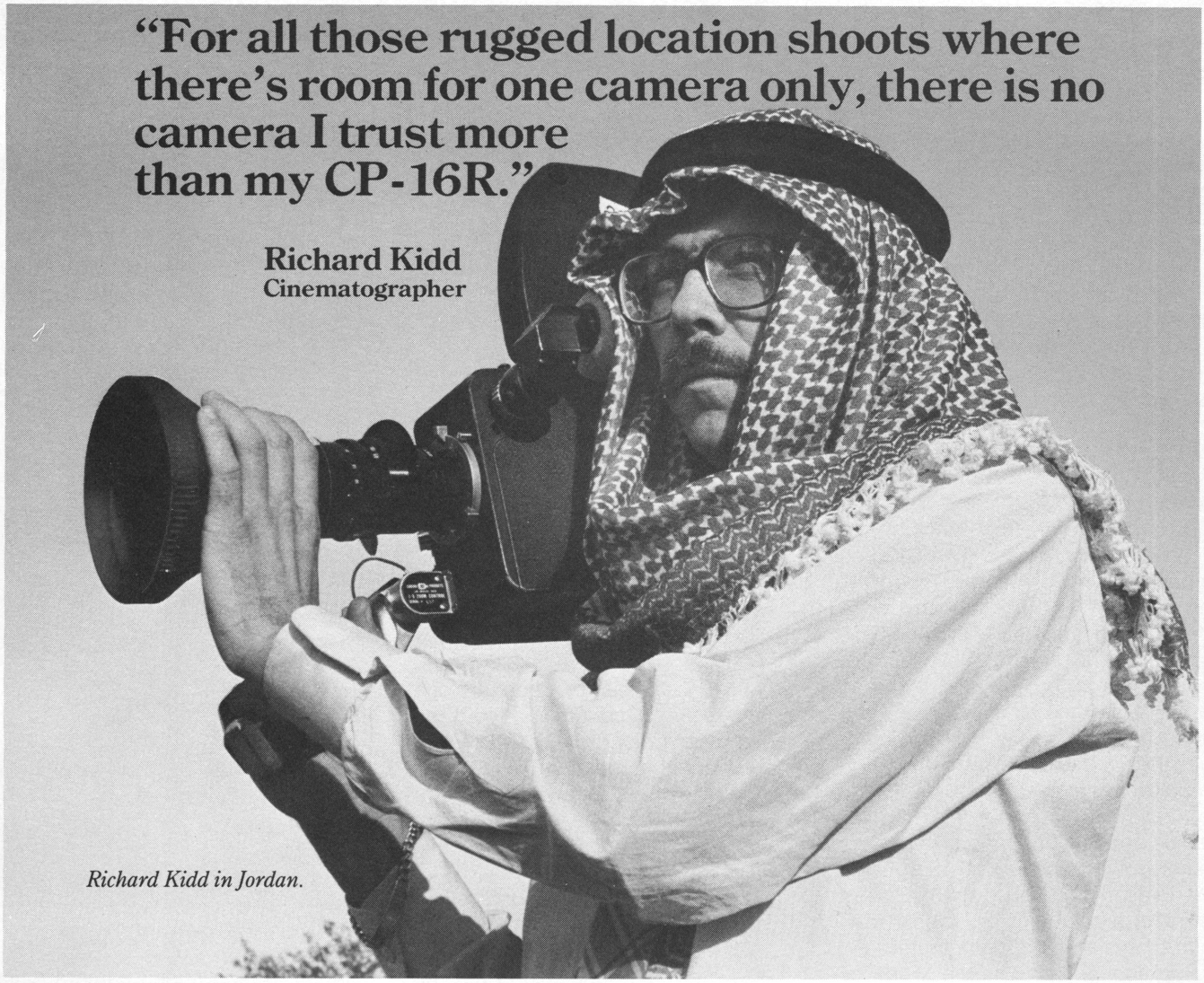


Photo-Sonics 4E.

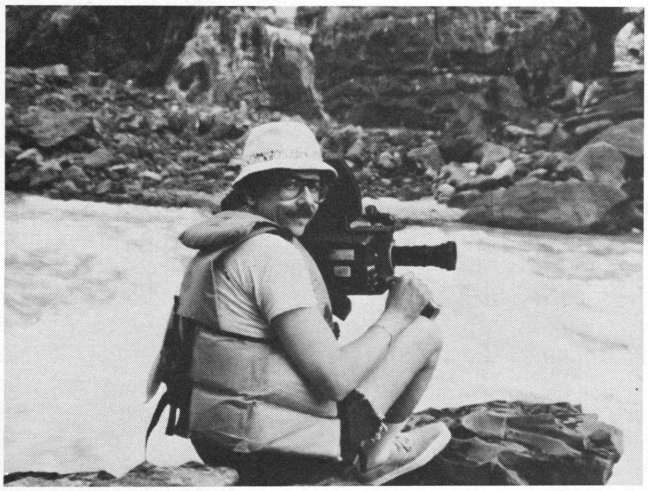
"For all those rugged location shoots where there's room for one camera only, there is no camera I trust more than my CP-16R."

Richard Kidd
Cinematographer



Richard Kidd in Jordan.

In the course of the last ten years, documentary and newsfilm cameramen all over the world have come to depend on the CP-16 as the most trusted and reliable 16mm single/double system sound camera around, bar none. Richard Kidd, president of the Dallas-based production company that bears his name, is no exception.



Kidd and his CP-16R are perched on a small cliff overlooking Chile's Bío Bío River during the filming of "River of Thunder," a TV documentary.

"In my 14 years as a cinematographer, I have yet to find the camera that can match my CP-16R for all-around versatility and ruggedness," says Kidd.

"Lightweight and self-contained, with outstanding single/double system sound capability, the CP-16R is the camera I can depend on even under the worst conditions in remote locations—whether shooting the rapids of Chile's Bío Bío River on a raft, or braving the hot sun and sand in the Jordanian desert."

Kidd filming the Roman ruins in Jerash, Jordan, with his CP-16R.

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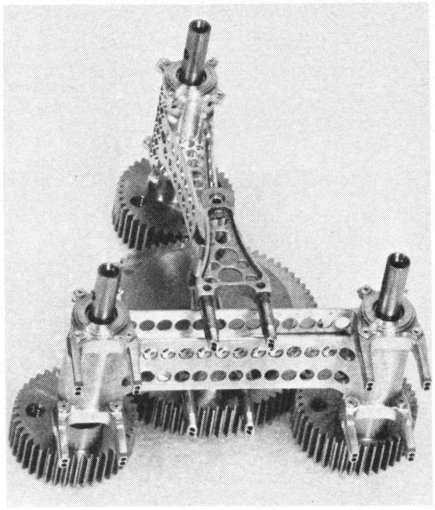
an air pump which forms part of the movement and sucks the film firmly into position and holds it flat during the exposure period and then blows it off the register pins to speed it on its way for the next exposure.

Not surprisingly the movement has to be regularly fed with a cocktail of special oils and greases, and at top speeds this must be done after every 1000 ft. of film has passed through the camera. Rotary prism cameras, on the other hand, are much more simple because the film does not stop during the exposure period but charges through the camera continuously at high speed.

Rotary prism cameras were originally developed by Eastman Kodak and the Electrical Research Products Inc. in the early 30's—and first used to accurately time the runners and record photo finishes in the 1932 Los Angeles Olympic Games. The first cameras ran at 1000 fps and were later found by the Bell Telephone Laboratories, who were the joint patentees, to be a pretty useful aid in sorting out some electrical relay and contact problems they were having at the time. Development has not stopped since and today full frame cameras with speeds of 10,000 frames per second and quarter frame cameras with speeds of 40,000 fps are available off the shelf. Streak cameras and other very highly specialized systems go much faster still.

Rotating prism cameras work by passing light from the lens through a rotating prism which optically bends the light path to compensate for the continuous movement of the film. They also incorporate a shutter which is synchronized with the rotary prism to significantly improve the usage resolution, more even exposure and great shutter efficiency. There are one or two technical conditions about the system that must be borne in mind:

1. There is no point in using a lens on the camera of wider aperture than that of the rotating prism optical system, (f/2.8 in the case of the 4B).
2. There is inevitably some slight loss of optical quality caused by going through the prism optical system although this is not severe and can be lived with.
3. Steadiness is not quite what one would call 'double exposure' standard (0.0025″ over 10 frames) but so long as you are not going to use it for multiple pass optical printing it is very adequate because any unsteadiness there may be is in very slow motion.
4. You have to use lenses with a long back focal distance to clear the prism system. Although it is not quite the maximum T2.8 lens the system will accommodate, we find the Cooke and Panavision T3.1 20–100mm zoom lenses to be very convenient as they give us all the focal lengths that are normally required and have sufficient clearance at the rear.
5. There is a blurred area at the top and bottom of frame that approximates to the frame line between Academy frames. This is no problem at all when shooting Academy, wide screen or TV but is a bit of a snag for Anamorphic work if there is important detail at the extreme top and bottom of frame. Under good circumstances no one will notice it, if the worst comes to the worst a slight optical blow up would have to be done.
6. You need a lot of light. The 4B has a maximum shutter opening of 72°. This means that at 2000 fps the exposure time is 1/10,000 sec and at 3000 fps it is 1/15,000 sec. and needs about 8 stops more exposure than at 24 fps with a 180° shutter.



System of Photo-Sonics 1W.

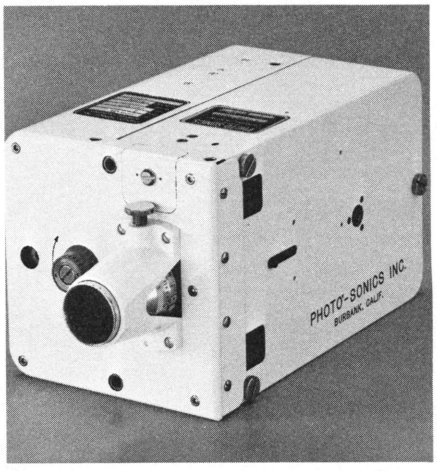


Photo-Sonics 1W.

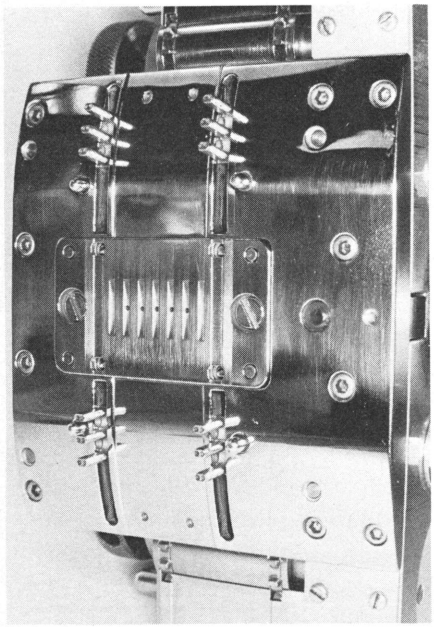


Photo-Sonics 4E movement—12 pull-down claws, 4 register pins and vacuum back.

Another high speed camera which has its place in professional filmmaking is the Polaroid Polavision system. This is a very small cassette loading Super 8 camera which runs at any speed up to 360 fps and has an instant process system which replays the film at 18 fps. The Polavision is useful when wanting to check what a slow motion (or speeded up motion) effect will look like on the screen. If you are not sure whether you need to shoot at 100 or 120 fps, or 200 or 360 or more you can shoot off an instant test on the Polavision. Similarly if you want to see how a shot worked out at the speed you shot it you can set up a Polavision alongside the 'real' camera and see instant dailies.

Because the Polavision replays at 18 fps it is necessary to run the Polavision at ¾ the speed of the main camera to get the same effect, running at 90 fps to simulate 120 fps, etc. It is equally useful to check if you can get away with shooting car chases at say, 16 or 20 fps without it looking ludicrous. ■

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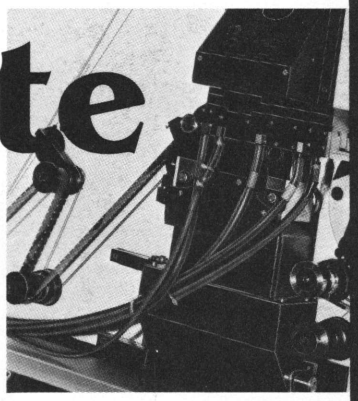

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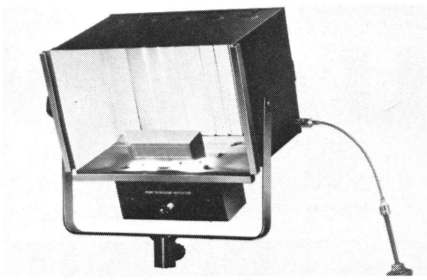

lens, Camralite effectively lightens or erases the harsh effect of shadows caused by facial lines and creases.

The Camralite contains a unique, variable area reflector in its rear wall. This allows the intensity of the light to be infinitely varied without affecting the color temperature or quality of softness of the light. A constant 3200°K is maintained throughout the intensity change. Thus, as the distance between camera and/or subject varies, no changes in exposure are necessary.

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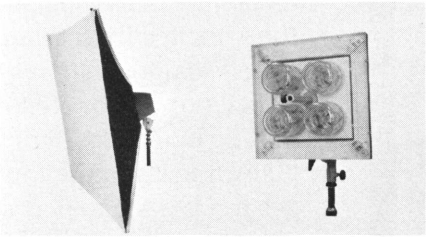

404, for 16,000, 32,000, 64,000 BCPS (guide apertures f/32, f/45, f/64 at 10 ft. with 100 ASA). A label indicates the cord which operates the cooling fan.

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Bulb Type	Watts	Volts	Life	Color Temp.	Beam
FOS-1	250	120	50	3200°K	Wide
FOS-2	200	30	15	3200°K	Wide
FOS-3	100	12	50	3200°K	Wide
FOS-4	50	12	4000	3100°K	Wide
FOS-5	25	12	4000	3100°K	Wide
FOS-6	50	12	4000	3100°K	Spot
FOS-7	25	12	4000	3100°K	Spot
FOS-8	85	12	4000	3100°K	Spot

FEATURES:

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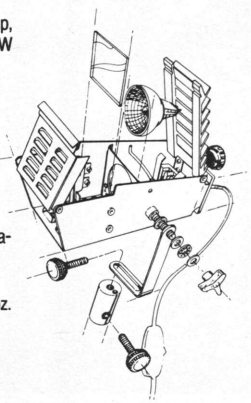

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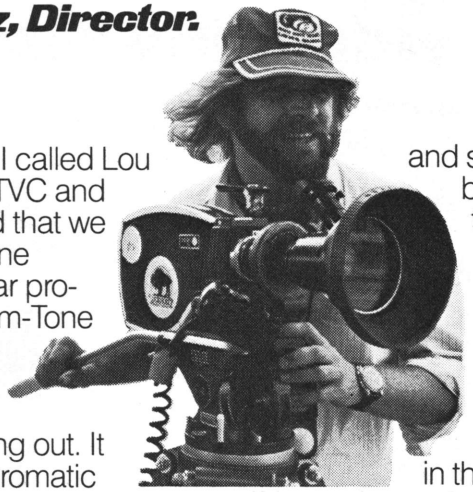
"I've found that distance is irrelevant. Wherever I happen to be shooting, it pays to send film to TVC in NYC."

—Tom Buckholtz, Director.



"I started using TVC on the personal recommendation of directors whose opinions I respected. Now I've been using TVC myself for seven years, always with excellent results.

"I found Chem-Tone to be a truly amazing process. It really brings out the detail in shadow areas, and it's far superior to comparable processes provided by other labs. In fact, Chem-Tone is virtually incomparable!

"TVC always comes through. I'll give you an example. Once, when I was set up to shoot in a barn in Missouri, I encountered an unusual type of lighting: an off-beat fluorescent light mixed with daylight. I called Lou Cangiano at TVC and he suggested that we test Chem-Tone against regular processing. Chem-Tone held the light at the barn windows without burning out. It gave me a chromatic look that was far superior to anything regular developing could achieve in this situation.

"Whether I'm shooting in New Orleans or on location anywhere, I don't think twice about using TVC for dailies. I do all my post production in New Orleans and send the film right back to TVC for final prints. We couldn't get faster turn-around from any local lab.

"Recently, I started using TVC Video, and in this area, too, I'm delighted. TVC's Alan Mitosky stays with every job, from start to finish, and can answer any question at any stage.

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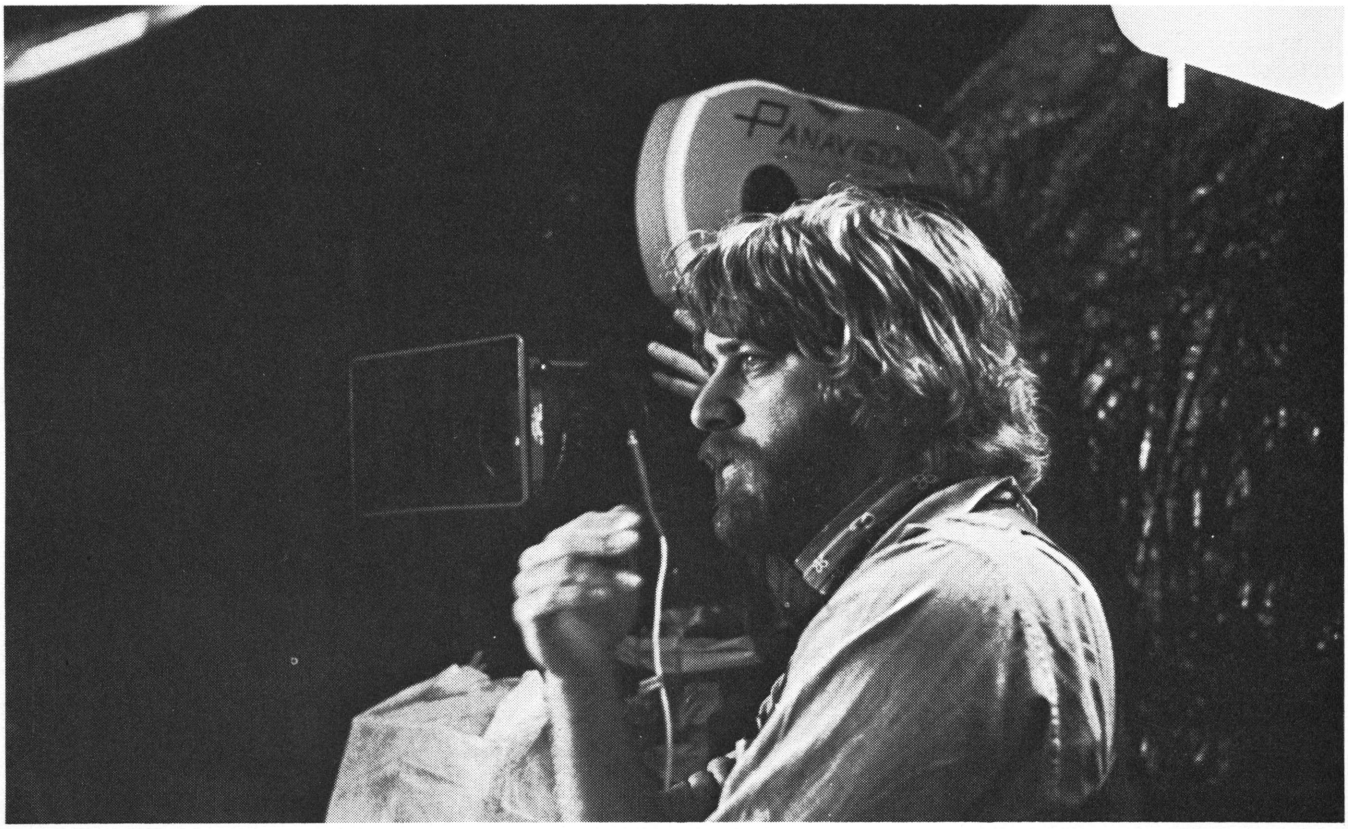
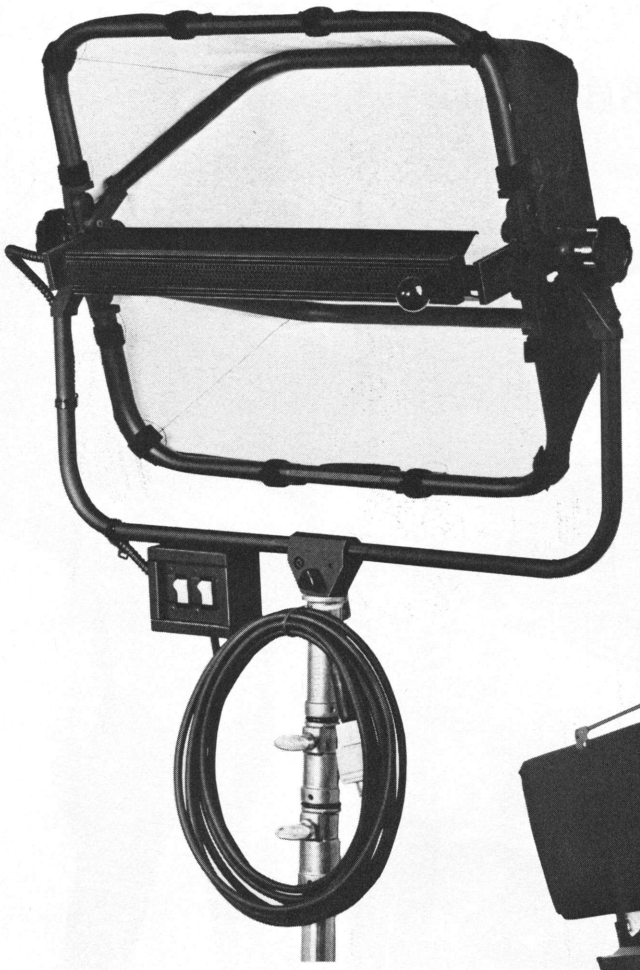


MODULIGHT

Modulight Systems is a new company on the block with a new approach to lighting. The basic concept begins with a folding, modular softlight and spreads to encompass a fully interchangeable system of lighting and related products. The product line has been designed to accommodate the needs of the motion picture and video tape industries as well as still photographers.

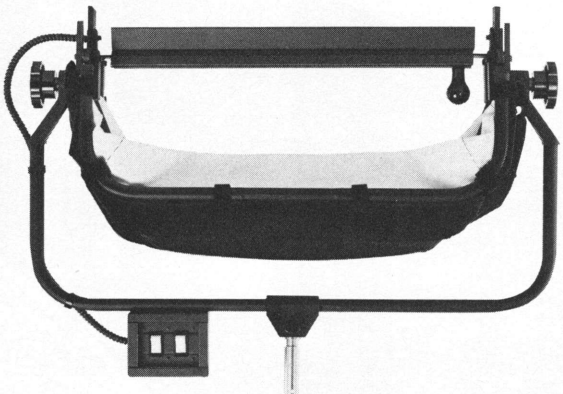
Modulight's president, Bill Hines, himself a photographer with a film production background, is quick to point out the difficulties of designing such a system. According to Hines, who worked on the product singlehandedly before enlisting investment capital and a design engineer, "The problem of designing any system is keeping it simple. You have to make certain that what you build today won't lock you in tomorrow. In my opinion, a lot of companies suffer from too little long range planning. We started with a carefully thought out statement of objectives and moved to a list of priorities for each specific product. Once we made the decision to go, we were in the lighting business from day one, and feel fortunate in knowing not only where we are today, but how our products will interface with one another ten years from now."

If Hines speaks of Modulight, a new company, as though it is already a force in the lighting industry, it is. A division of Forsyth International, Ltd.,



The 28" 2000 watt Softlight fully assembled.

The 42" 8000 watt folding Softlight fitted with top and bottom light trim assemblies.



The 28" 2000 watt Softlight in its folded position.

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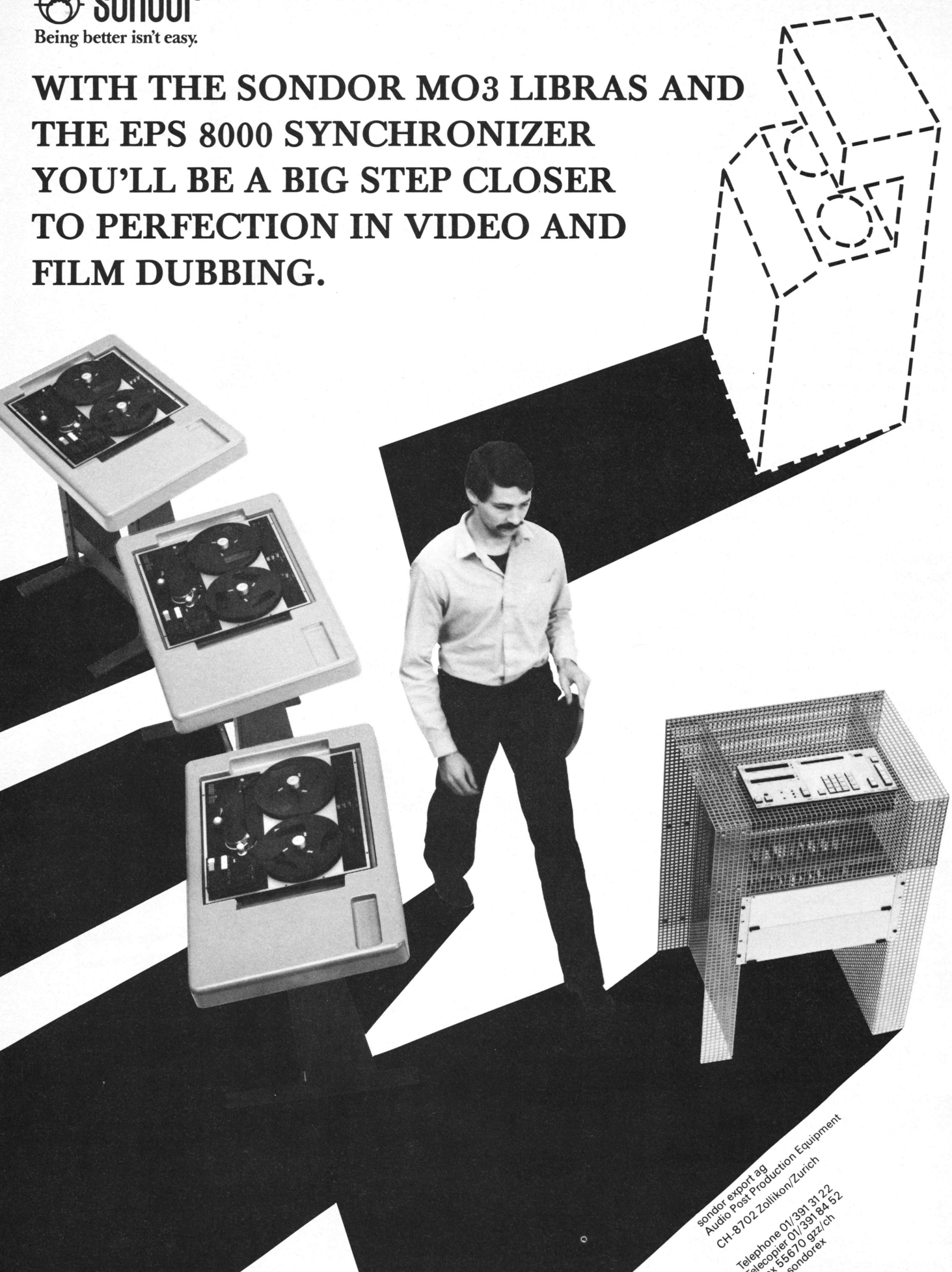

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Modulight is well endowed with working capital and swift on its feet in terms of future plans. The basic concept of a lighting system is simple enough to state, but designing such a system is a long, tedious process. Most of the thinking that launched the Modulight concept came from Hines experience as a photographer/cameraman. The function and execution of the concept came from the engineering skill of Drew Lindsey, Modulight's design engineer.

The list of priorities that charted the course for Modulight's first system was, as mentioned, extensive. Lindsey was given the task of designing an entire system of products around as few components as possible without compromising the effectiveness of any single product.

First, as a basic product, Hines wanted a softlight large enough in size to provide illumination of high aesthetic quality, yet capable of folding into a compact package, and cased to facilitate efficient transportation. Disassembly and the use of tools were ruled out from the beginning.

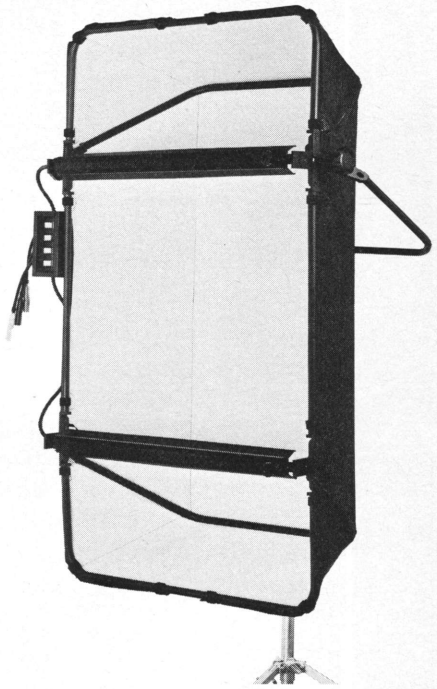
Secondly, light weight, virtually indestructible construction was considered essential to the success of the product. The largest formats had to be light enough to facilitate ease of set up, and where desirable, operation from a boom arm. On the other hand, all products had to be rugged enough to withstand the rigors of production and repeated shipment without the protection of a case.

Third, with respect to performance, a generous illumination level with sufficient throw and breadth of coverage to stand alone on an average set was considered imperative. Light source options had to include HMI, tungsten-halogen, and electronic flash. Further, all light sources had to rotate a full 360° in order to make asymetrical light output possible by directing light higher or lower within the light housing. Finally, variable switching across the light source had to be provided, not only to control light output asymetrically from left to right, but also to provide symetrical control of light intensity.

Fourth, following a careful study of reflector design, it was determined that a trapedzoidal reflector, rather than the more common reflector consisting of a curved back with box sides, was preferable. Testing proved that the trapezoidal design provided ideal center beam intensity and fall off characteristics throughout the effective range of the light. In addition, the effective range of the trapezoidal reflector was found to be greater than comparable competitive softlights, based not only on foot candle output, but on beam quality and coverage as well.

Fifth, the system had to provide for fast interchangeability of components to make construction of additional light sizes and formats possible. Size and format interchangeability would allow lights to be tailored at will to specific situations. Sixth, the same components used to build lighting had to be adaptable in constructing reflector boards, butterfly frames, flats, technical tables, and other related products.

Finally, in the process of designing a barndoor system, a new product, considerably more animated than the conventional barndoor was developed. This new, highly animated barn door, later dubbed a Light Trim®, became a design priority, and upon completion, a valuable addition to the overall system.



The 78″ x 42″ 8000 watt Troughlight fully assembled.

From the above criteria, Hines and Lindsey were able to successfully design a fully interchangeable modular system based on the common increment of seven inches. From two folding connectors, a series of yokes in varying sizes and shapes, and one of four flame retardant reflectors, a basic softlight housing is constructed in one of three standard sizes. The largest softlight is an impressive

PERFORMANCE DATA

28 inch 2000 watt softlight with 2 FCM 1000 watt, 120 volt, 3200° Kelvin Tungsten-Halogen lamps.

Distance	Intensity, Foot Candles	Beam Coverage*
4 ft.	640	5'10″ x 4'7″
8 ft.	125	14'10″ x 11'3″
12 ft.	50	22'9″ x 14'
16 ft.	25	30' x 20'
20 ft	16	40' x 25'

*Beam coverage computed at ½ of center beam intensity.

42 inch 4000 watt softlight with 4 FCM 1000 watt, 120 volt 3200° Kelvin Tungsten-Halogen lamps.

Distance	Intensity Foot Candles	Beam Coverage*
8 ft.	320	13' x 11'6″
12 ft.	125	20'4″ x 17'8″
16 ft.	80	31' x 23'3″
20 ft.	40	32'5″ x 29'1″
24 ft.	25	38'10″ x 34'10″
28 ft.	20	45'4″ x 40'8″
32 ft.	16	51'9″ x 47'1″

*Beam coverage computed at ½ of center beam intensity.

42 inch 8000 watt softlight with 4 FEY 2000 watt, 120 volt 3200° Kelvin Tungsten-Halogen lamps.

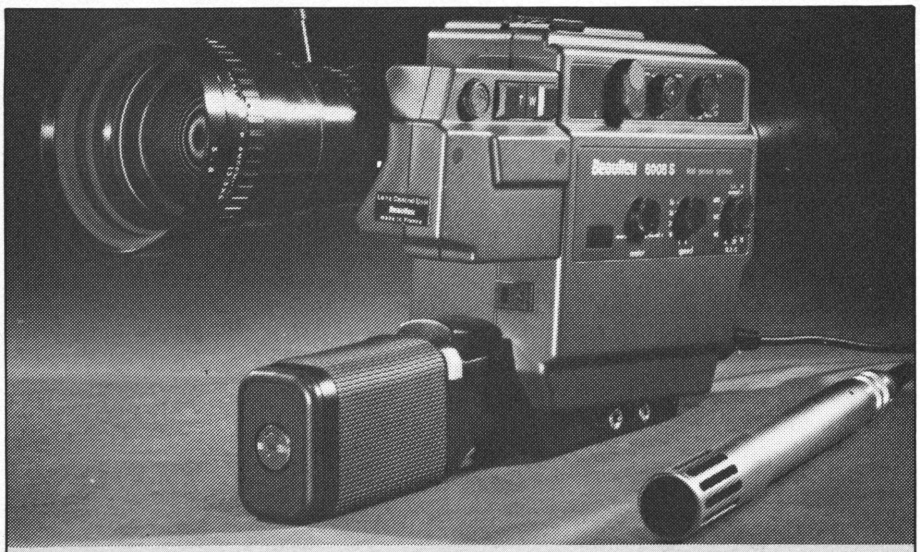
Distance	Intensity Foot Candles	Beam Coverage*
8 ft.	640	14' x 11'7″
12 ft.	320	20'9″ x 17'7″
16 ft.	200	27'9″ x 23'2″
20 ft.	125	32'3″ x 28'
24 ft.	80	38'10″ x 34'10″
28 ft.	64	48'8″ x 40'8″
32 ft.	40	55'7″ x 46'5″
36 ft.	32	62'6″ x 52'3″

*Beam coverage computed at ½ of center beam intensity.

42 x 78 inch 800 watt troughlight with 8 FCM 1000 watt, 120 volt 3200° Kelvin Tungsten-Halogen lamps.

Distance	Intensity Foot Candles	Beam Coverage*
8 ft.	500	12'6″ x 12'10″
12 ft.	225	18'6″ x 17'10″
16 ft.	125	26'4″ x 24'
20 ft.	90	37' x 30'8″
24 ft.	64	45'7″ x 33'
28 ft.	50	48'6″ x 45'
32 ft.	40	55' x 48'3″
36 ft.	32	62'8″ x 54'3″

*Beam coverage computed at ½ of center beam intensity.



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42″x36″. With the addition of a light source, the unit is complete. Light sources range in output from 2000 to 8000 watts in tungsten-halogen, from 625 to 2500 in HMI, and from 2400 to 7200 watt seconds in electronic flash.

The weight of the standard 42 inch softlight equipped with a 4000 or 8000 watt tungsten-halogen light source is a mere 27 lbs., and its folded size, a compact 49″x27″. Smaller sizes include a 35 inch 3000/6000 watt softlight, as well as a 28 inch unit capable of 2000 watts. HMI units are slightly, though not appreciably, heavier, and are available in 625 watt, 1200 watt, or 2500 watt capacities. Electronic flash softlights are available in up to 7200 watt seconds of output.

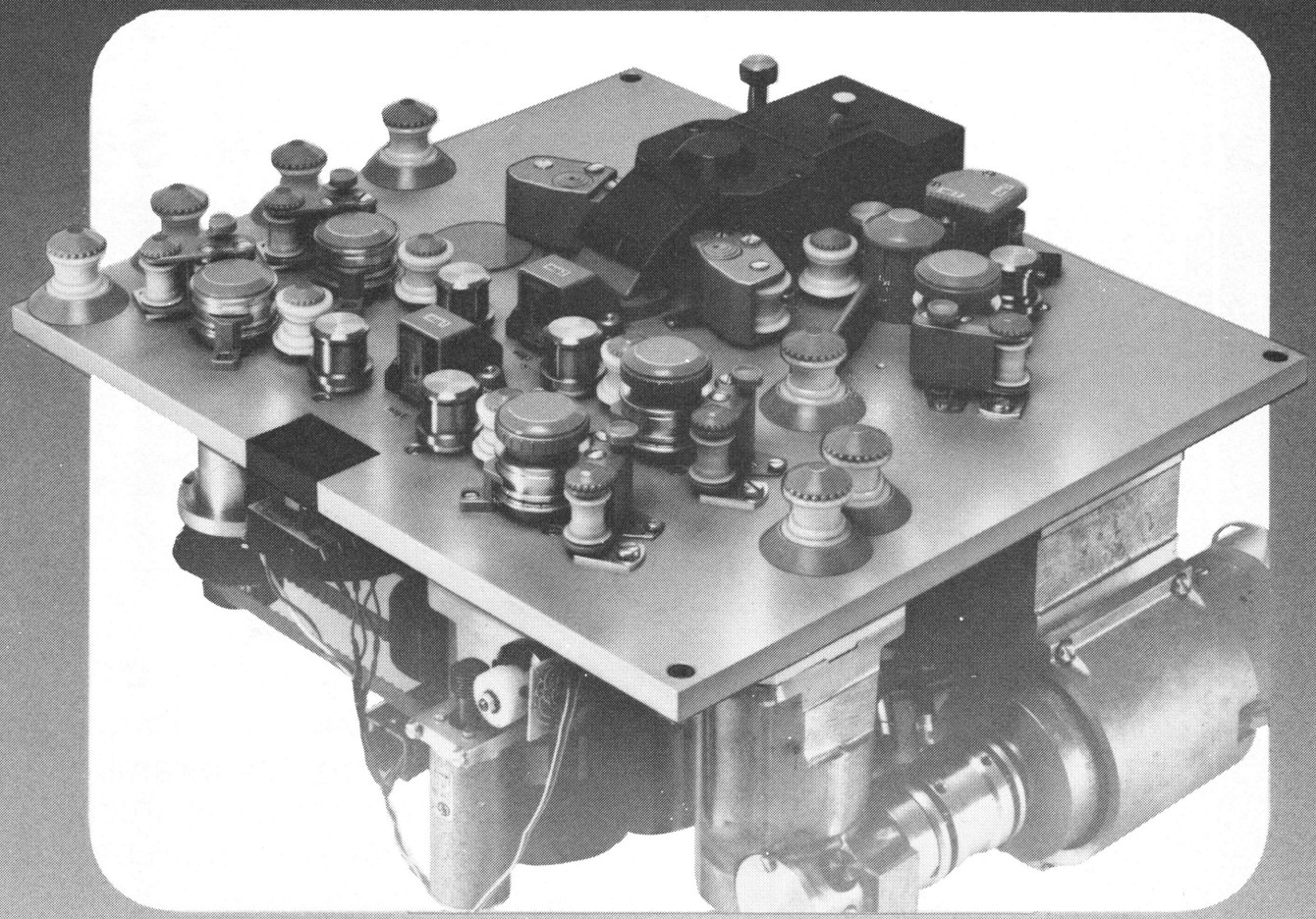
With the addition of straight tubing in standard lengths, a folding troughlight is constructed. Each softlight with appropriate straight tubing, two additional folding connectors, and an additional light source becomes a troughlight of twice the power of the original softlight. The weight factor of a given troughlight is negligible when compared to the companion softlight. Troughlights are available in 28x45, 35x58, and 42x71 inches.

The final lighting product is a folding punchlight. Using only the front frame assembly of the 35 inch softlight and a pivoting yoke, a three gang light source bracket is attached, accommodating up to 9,000 watts of tungsten-halogen light from three separate light sources. Each light source is fully switchable and can be tilted for light control. Using HMI sources, the potential is 3600 watts, and with electronic flash, 7200 watt seconds. Lighting related products, all using the system concept include Light Trims, butterflies, reflector boards, flats, technical tables, ATA cases, and a host of additional accessories, too extensive to mention here. All integrate within the overall system and quickly interchange.

According to Hines, initial shipments of products to dealers will commence in late October. Additionally, the system will be on display at the SMPTE Show in New York this November, in both the CineMills and Matthews exhibits. As for Modulight's future plans, there are several new products in the research and development process. A complete catalog is available from Modulight Systems Inc., P.O. Box 1009, Cumming, Georgia 30130. ■

THE HEART

STEENBECK precision in detail



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TAMING THE MYTHICAL MIRED
HMI Lighting Equipment & Techniques

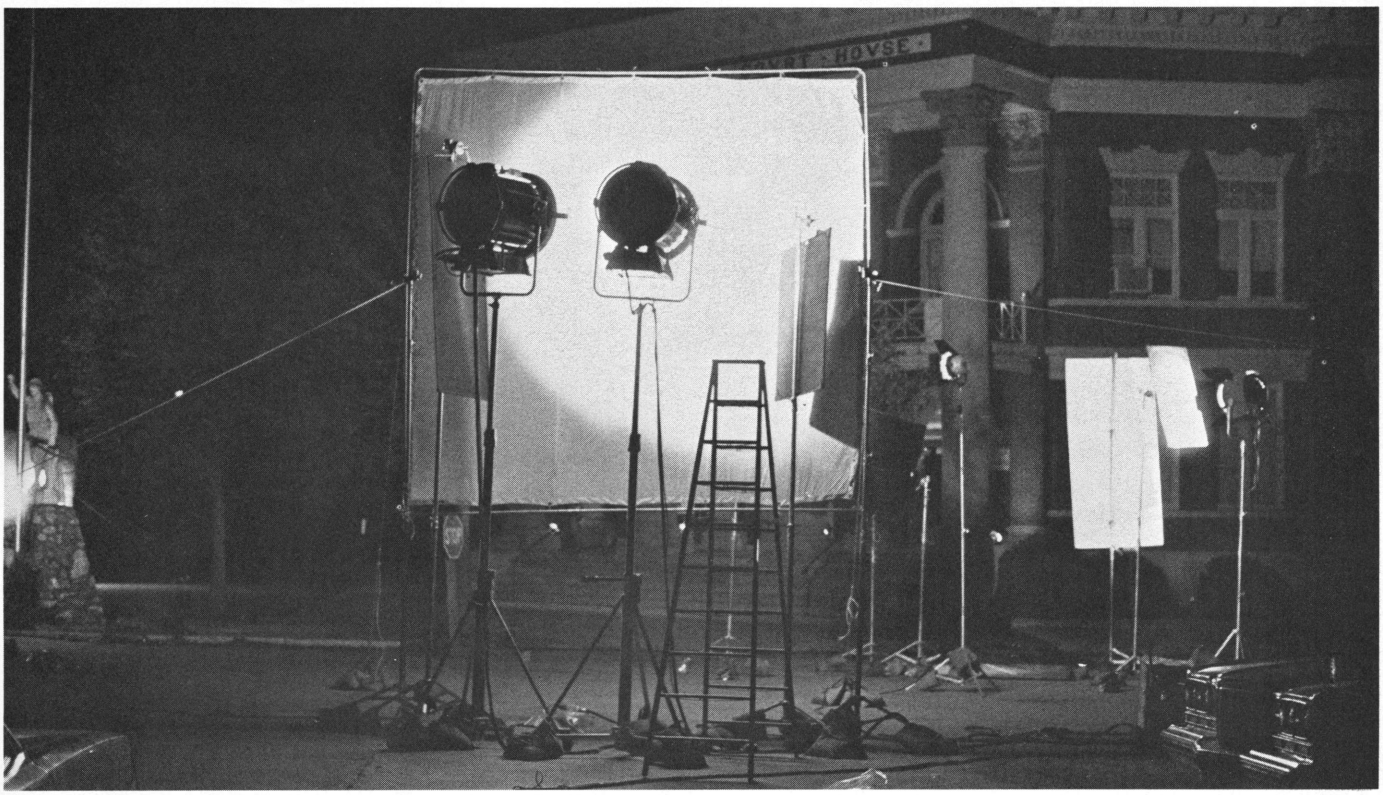
by RICHARD B. GLICKMAN

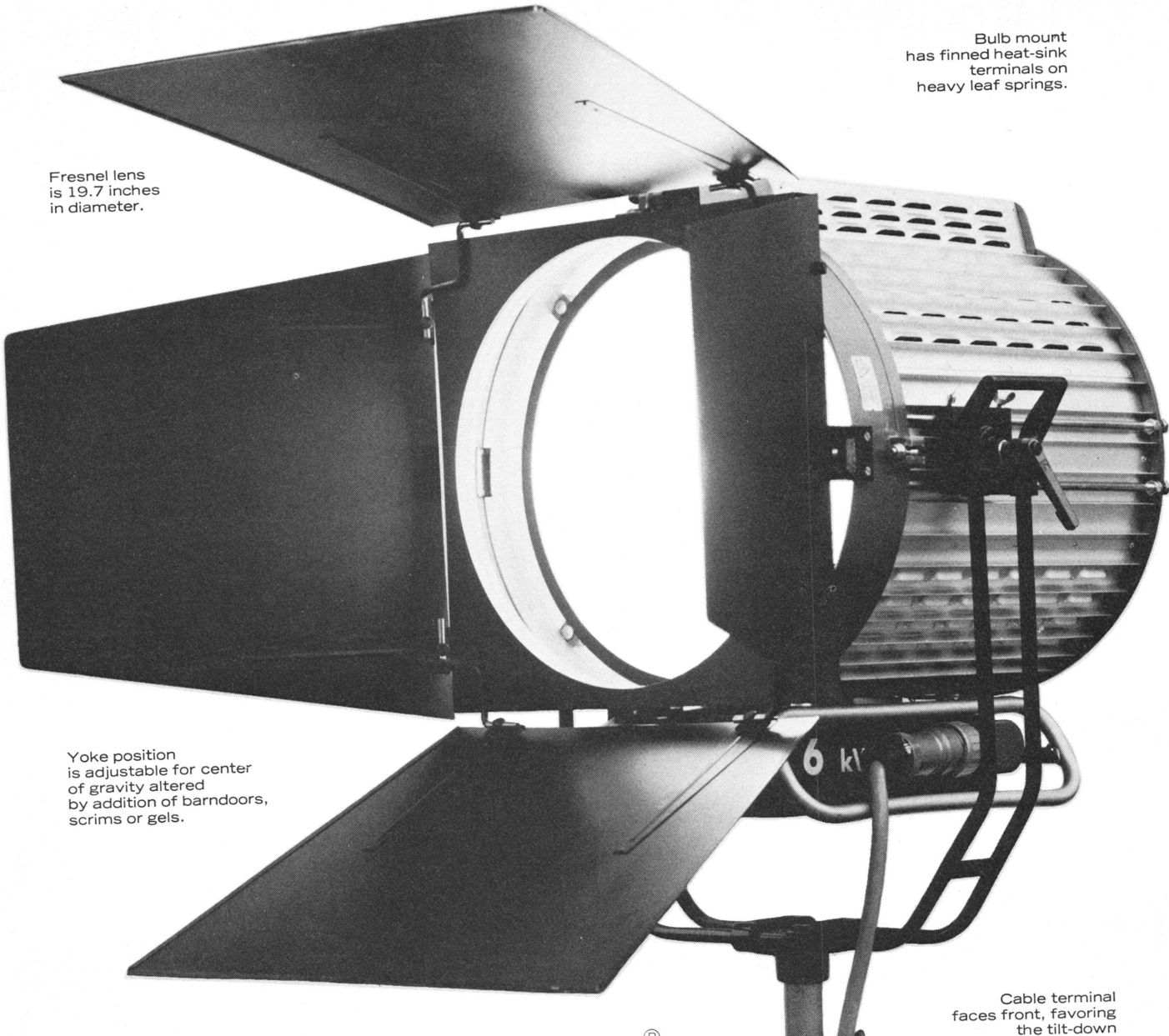
In the field of entertainment lighting, during the past 20 years or so, there have been two major shifts in the type of light sources utilized. The first was the arrival of the tungsten-halogen lamp, and the very significant changes wrought in the types of lighting fixtures that were produced for this compact range of sources. The second was the coming of the enclosed arc A.C. discharge lamps (HMI, CSI and CID).

TUNGSTEN HALOGEN LAMPS

The primary advantage of the tungsten-halogen lamps is that they provided constant color temperature incandescent sources. The small size and compactness of these lamps, which was necessary in order to make the halogen cycle operate properly, proved to be a great impetus for the designers of lighting fixtures in the entertainment field. Complete new families of equipment appeared on the market, manufactured by companies that few professionals had heard of before. The concept of lightweight portable equipment for professional use became a reality very quickly, a trend which continues to this day. The availability of this equipment gave a boost to the production of film on location by making available to the low budget and 16mm film a

The 6000 watt Luxarc by LTM (ABOVE) will flood an area 112 feet in diameter from a distance of 100 feet with between 21 and 42 footcandles. (BELOW) Two LTM Luxarcs being used through silk for a night exterior shot on a commercial.





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All but the 200W are Fresnels. The lens on our 6kW is 19.7 inches in diameter, to take maximum advantage of the HMI bulb's characteristics. Shock-mounted, of course.

The ribs on the housing add rigidity without adding weight – and they effectively double the surface area, for radiation cooling. Convection cooling inside our fixture is efficient, too. The HMI bulb runs at a temperature lower than that recommended by its maker.

The ignition circuit is in a separate module mounted below the burn chamber. It stays cool and it's easily accessible. The tube fran floor-stand protects it when y put the fixture down.

The 6kW head weighs 85 l The ballast weighs 134 lbs. It's t smallest 6kW HMI ballast you c buy today.

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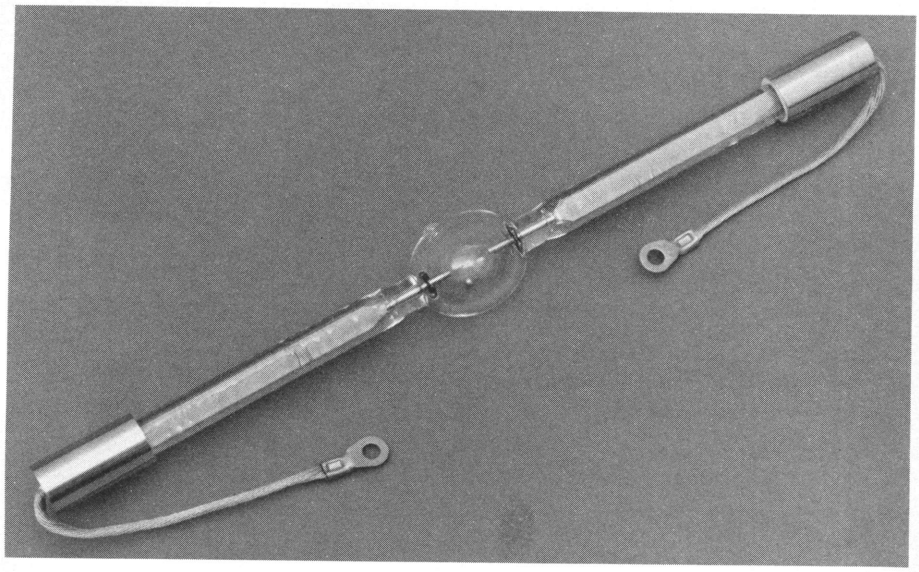
A Double 575 Soft "D" HMI softlight from LTM can cover a 34' x 28' with 26 to 52 footcandles from a distance of 20 feet. The head weighs 45 lbs. and the ballast weighs 61 lbs. (BELOW) Bounce light from the ceiling provided by 4K LTM Luxarcs for a setup in a bank.



A Daymax 6000 watt gas discharge globe designed for HMI units produced by Ianiro, Arriflex, LTM and Mole Richardson.

range of lighting instruments that were affordable and easily used in location settings. The impact of the tungsten-halogen source continues to be felt, via the continuing widespread use of the fixtures developed to date, as well as the new equipment still being brought out to utilize this source.

The utilization of the tungsten-halogen source was quickly extended to the television production field where it soon became the most widely used light source in TV studio applications. In fact, the television field is probably closer to being fully converted to the use of these sources than any other part of the entertainment lighting industry. The whole field of cyclorama lighting alone was created because of the availability of

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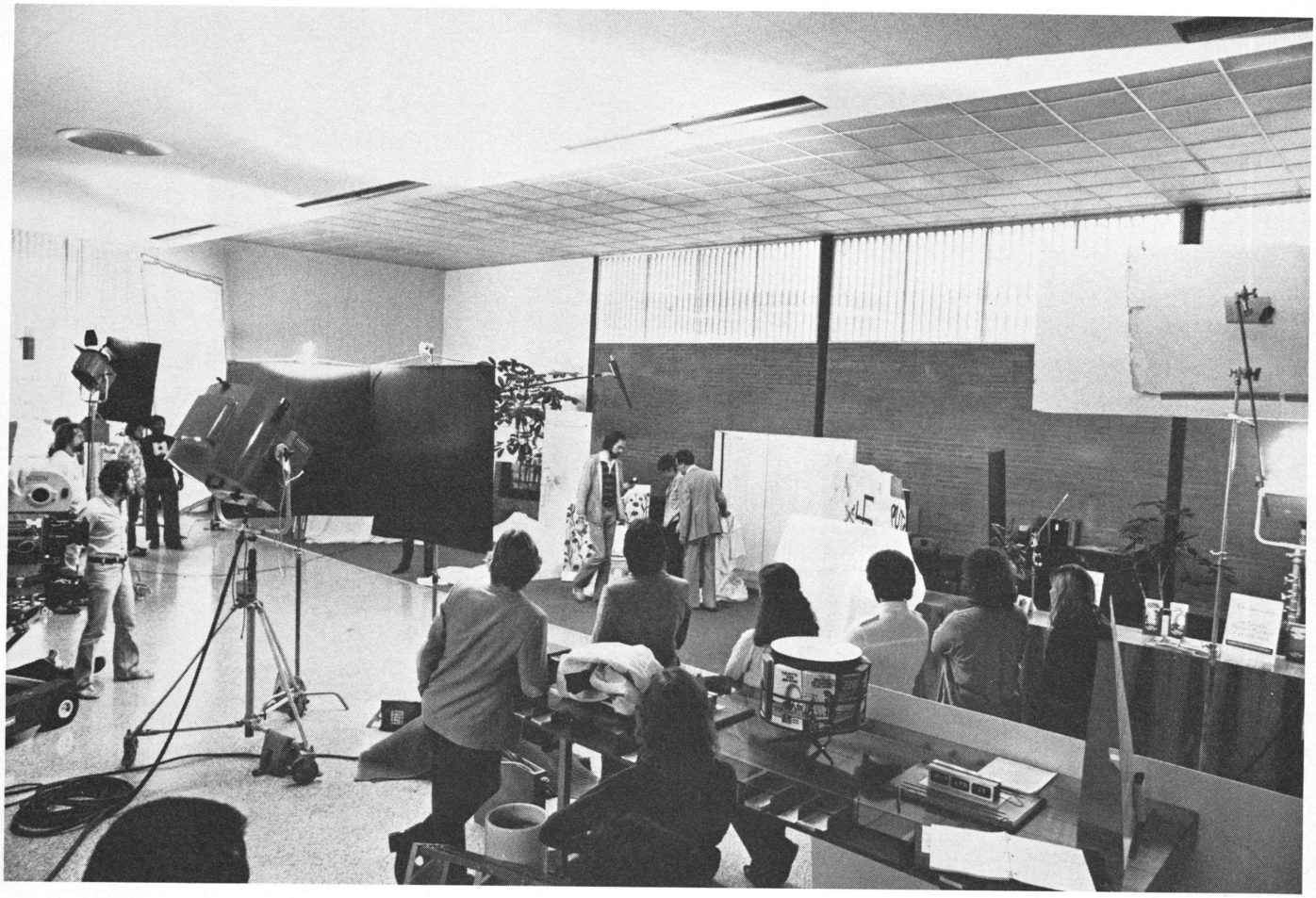

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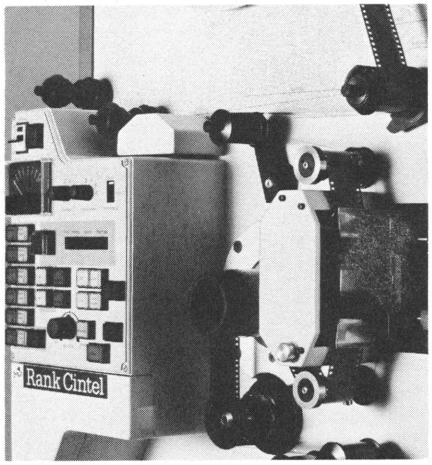

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By anybody's standards; the FeRRIT is a sound investment in reliability, versatility and, above all, quality. For the Rank Cintel telecine user, there is the added bonus of system, spares and technology compatibility.

For the impressive facts on the MkIIIC and FeRRIT, contact your nearest **Rank Precision Industries Inc.** office:

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Lighting for the Video Camera

by WILLIAM M. KLAGES

This will not be a "how to" article in the usual sense, but some personal thoughts and observations on the subject of lighting for a photographic medium. Much has been said concerning the problems and techniques of lighting for the film camera as well as lighting for the video camera. In all circumstances, the two areas have been treated as separate, distinct worlds . . . never to be considered or even mentioned in the same context. In the general sense, there is absolutely no reason for this to be. In the specific sense, we need to be aware of the major technical differences between the two systems.

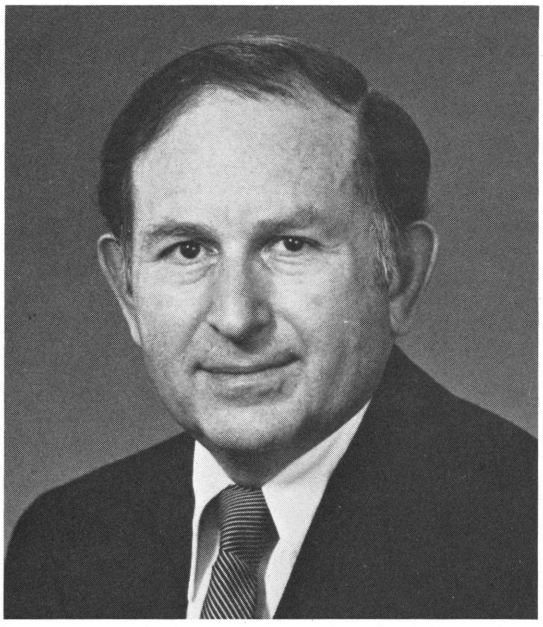
THE PROBLEM

Speaking as a "video" person, it has been difficult to get filmmakers to admit that the video image is "photographic" or "cinematic" (Should there be a "videomatic?"). The serious film image-maker usually has great difficulty in applying the term "photographic" to describe the efforts of the video image-maker. But the video camera is a reproduction device. An image recorded on videotape can be transmitted on a television signal equally as well as one recorded from a film camera. What then is the problem? Why this lack of acceptance? It is difficult to believe that it is due to a reluctance to accept this "new" technology, now over 30 years old. I believe that this attitude is the result of an honest feeling that the photographic results from the video camera are inferior from a creative standpoint to those obtained from using a film camera.

In this article, I would like to limit the scope of our discussion to the subject of lighting for television transmission, no matter what the recording device may be . . . the film or video camera. I will not touch upon the subject of using the video camera as the recording device for theatrical release motion pictures. At the present time, there is no method utilizing this technique that can approach the quality of an image recorded directly on 35mm film.

EMPEROR'S NEW CLOTHES

Let us discuss some of the "differences" between lighting and production techniques for television programming using either the film camera or the electronic camera. If some of the examples chosen to illustrate the similarities may seem superficial, I apologize. The only purpose in relating them is to strengthen my case that most production situations are not unique to either video or film.



William M. Klages has won three Emmy Awards for lighting direction and has been nominated twelve times including this year. He is vice chairman of the board at Imero Fiorentino Associates.

Great mystery must surround our tools. We find that the end result takes a back seat to the technique involved. Filmmakers and videomakers alike can be accused of promulgating these great mysteries. The most basic mystery is the prevailing jargon. This is a very local phenomena. God help the lighting artist who makes a terrible slip by referring to a "siamese adapter" when "twofer" (or "martingale") is the required password. "Density" is hardly in common usage in a television studio and "signal level," although closely related, is never heard in the confines of a film set. Hence, the popularity of the glossary. As we all have seen, terms which must be interpreted for each local situation become self-defeating as a result.

Many years ago, I was assigned to light an automobile commercial which had always been shot on film. The client was forced to do the commercial on video tape because of an immediate air date. He was not pleased and chose to find fault with anything and everything concerned with the video tape operation. One of the elements that received his direct attention was a "missing" reflector directly overhead and slightly downstage of the automobile. No amount of discussion (I was much less experienced then) could convince him that this reflector would accomplish nothing. So as a result I had my crew suspend and light the reflector. Needless to say, it had no effect upon the image. We then went on to solve other problems. The element of mystery had been added. One step forward for Madison Avenue . . . and one step backward for the visual sciences.

In a television studio recently, I asked the purpose of a piece of spun glass covering the front of a 4KW softlight. The lighting man who had used the diffusion over the softlight was not in attendance to defend himself nor to observe the simple test that I performed. I demonstrated that he could have saved a great deal of spun glass by merely turning off half of the lamps in each softlight to achieve the identical quality of illumination.

The mysteries also give birth to other more alarming mysteries. The case of the two-way barndoor still

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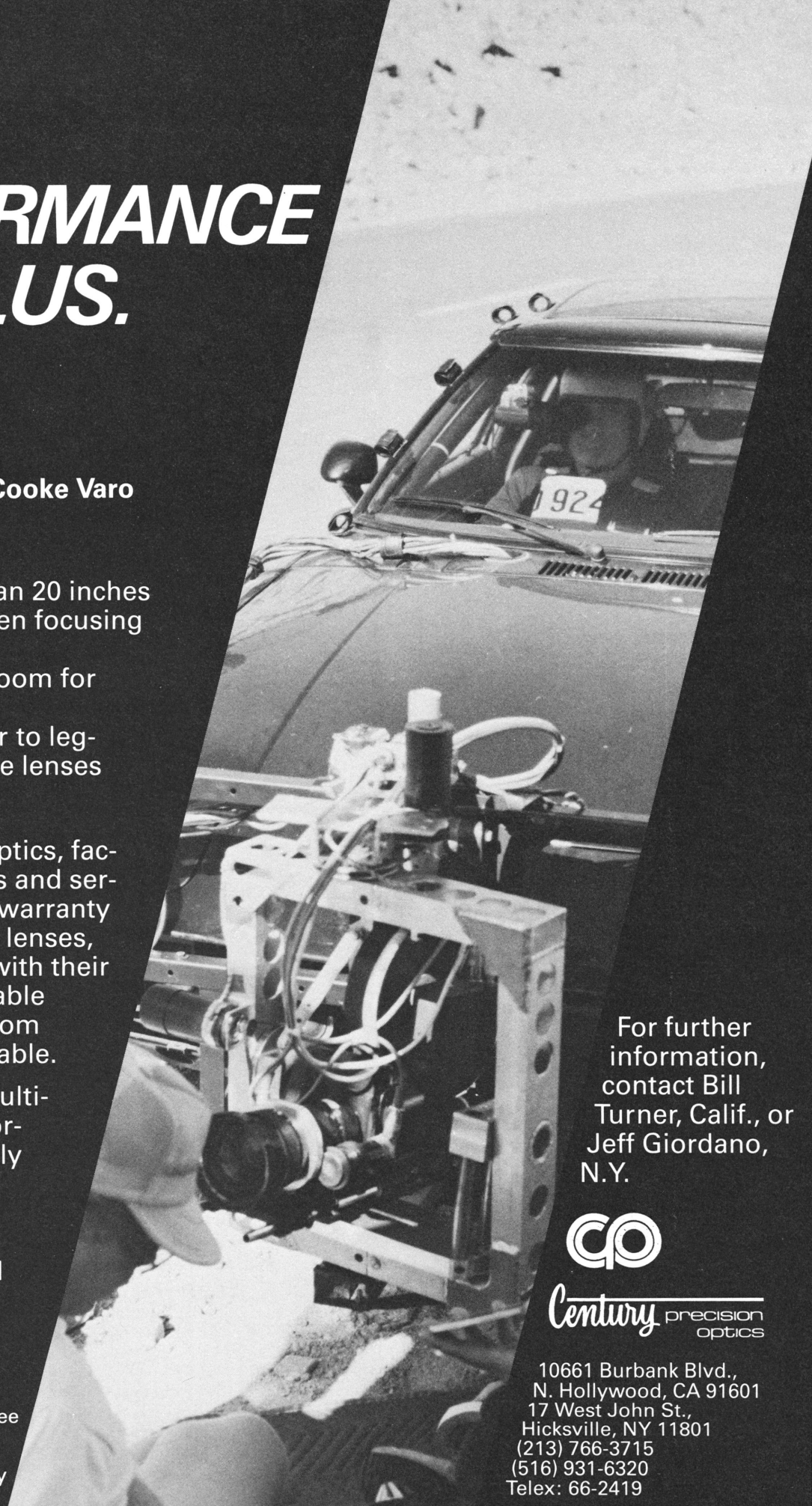

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remains an enigma to me. The collapsible four-way door, a necessity in a multiple camera situation for convenience, speed and practicability is never included in film production lighting equipment complements. Why?

Allow me to tell a favorite story. It might have taken place in a sound stage (which it didn't) as well as television studio (which it did). I was lighting a weekly variety show. During the first show of the season, the 20 back-up singers appeared in raincoats whose reflectance was nearly equal to the pure white of magnesium oxide. Although during the first show the raincoated group was in the background and controllable, I knew that we would ultimately have the impossible situation where the group would be in the foreground with our star. We would then have to give the raincoats billing as a result of their visual predominance. I spoke to our costume designer about the unacceptability of the raincoats. She was sympathetic and seemed to understand the problem.

The following week saw our singers prepared for inclement weather grouped around our star who, for some reason did not have a raincoat, but his favorite cashmere sweater. The television picture was a disaster. When I complained to my costume designer associate, I heard what has become a show business tradition, "I cannot understand your problem, WE USED THEM BEFORE!" Life goes on.

All my examples should have a familiar ring. The environment of a film production is basically no different from what exists in video production. Certainly the same elusive subjective thinking is present in each discipline. Only certain pieces of hardware are different.

VIDEO REMOVES MYSTERY

Now the video camera enters the scene with the promise of removing all mysteries . . . or does it? We see the results of our efforts immediately, instant "dailies." However, Murphy's Law is basic to electronics. A whole new crop of dilemmas present themselves. We are told strict rules that must be applied or else catastrophe will result. The glossary becomes so loaded that its seams are bursting. The lighting becomes so technical that there seems little hope for the "photographic." And, of course, we must adhere to the tradition of the multiple camera shooting.

Multiple camera shooting is the single factor that has most restricted the video-maker from obtaining superior photographic results. Luck, at times, will create exceptions to this generalization, but hardly proves the statement incorrect. No matter what lighting style you may choose, "high key," "natural," "film look," "single source," "low contrast," "source," (no glossary provided), you are visualizing a single viewpoint. You expect to maintain the same visual style throughout. For each shot, the basic lighting set-up is altered so that the style is consistent. When lighting for the multi-camera, you cannot make these individual alterations. I must add, at this point, that this situation has become even more aggravated by the use of a complete vertical structure, a recording channel for each camera. The compromises are even more extensive.

A good trick is to use a black and white monitor to evaluate image brightness relationships.

But, is the photographic quality of a multiple camera film shoot any better than its video counterpart? The problem of multiple viewpoints, the mechanics of equipment and personnel displacement are common to both situations. As a result, the photographic quality of both is one big compromise. We should be sympathetic to image-makers with high standards having to cope with the heartaches of the multi-camera operation.

Television production using the electronic camera has been primarily multi-camera. However when we do have the single camera situation and exercise care the result is very "photographic" and of high quality. Since this shooting method is exercised so seldom it is no surprise that filmmakers have such poor opinion of video's cinematic qualities.

It has been proven to my satisfaction that in the majority (note: not all!) of shooting situations, "photographic" results of high standards are possible in video when the single camera production technique is utilized. However, you must know the serious shortcomings of the video camera. Awareness of these considerations should then form the basis of lighting for the electronic camera.

IMPORTANT DIFFERENCES

Probably the most disconcerting difference confronting an experienced film lighting person operating in the video environment is attempting to evaluate his efforts on a television screen. Usually he can see a number of screens, all with the same image reproduced in what appears to be every combination of hue, brightness, color intensity, contrast imaginable. At this point he will probably hear another great statement, (a showbiz tradition by this time), "If you want to see what it really looks like, watch the video engineer's monitor." Our poor hero, completely frustrated by this time, will not realize that the videoman's monitor has been set for high color saturation and low brightness to assist the engineer in making his operating adjustments.

The truth is this: Unfortunately, the performance of the device, the cathode ray tube (CRT), upon which the entire system's image reproduction specification is based is not consistent. Adjustment of a television monitor or receiver is, at best, subjective. There is a great deal of difference of opinion among technical personnel responsible for the adjustment of this equipment.

It does take some experience and time to be able to evaluate the image on a monitor not in perfect adjustment or, even worse, on a receiver with a non-standard transfer characteristic. Today this is a very common situation as small, portable receivers are adapted for monitoring. Even after adjustment by the same individual, there is no guarantee that the screens will agree. A good trick is to use a black and white monitor to evaluate image brightness relationships. These relationships are quite apparent even on a monochrome monitor that is not in proper adjustment.

The next step is even more elusive, the evaluation of the color. You must rely on some very evasive indicators. The exposure is generally set for the camera to give an accurate reproduction of human skin tone. Knowing the quality of the illumination upon your subject, if you feel that the monitor is showing a true representation of this subject, assume that the monitor is properly adjusted. The next step is loaded with pitfalls. Judging fine graduations of color saturation and hue is not easy considering the lack of conformity in the television system monitoring. Initially, I would suggest

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not being too critical until you have enough experience to see the relationships that actually do exist from a color standpoint between the subject and the end result on the television receiver, adjusted properly or not. It will take many hours working within the system before one can feel at ease with this aspect of the system. It is not easy.

The next difference is easier to deal with. The television image, due to the standards by which the system transmits, is low resolution. No matter what is the definition of the image focused on a negative or on the image surface of a video camera's pickup tube, it ends up limited to the maximum resolution allowed by the system parameters. No matter that you put a state-of-the-art prime lens on your taking camera (film or electronic), the final result will not be any sharper than the system is capable of delivering to the screen.

So to improve the apparent resolution, we must keep the main areas of interest to as small a number as possible. Items of secondary interest should be eliminated or placed in unimportant positions in your composition. Rely heavily on contrast to replace the lack of resolution. (Notice how I'm beginning to sound like a rudimentary text on photography. We have returned to the basics.)

The last difference I would like to discuss is the most important to obtaining the "photographic" image from the video camera. It is also, I might add, the one that anyone proficient in lighting for the film camera will have the most difficulty in accommodating. The problem is the video system's inability to reproduce a great range of brightness. This, in itself, might not be too bad if it were not for the additional problems introduced as a result of exceeding this narrow range. Exceeding the brightness range in the low lights is no problem. It is assumed that you have allowed this since you wish those areas to be black. Fine, all well and good.

You will recall that I qualified my earlier statement concerning my belief that the video camera is as capable as the film camera in obtaining high quality photographic. It is, in most cases. However at the top of the brightness scale, the system does not reproduce any definition for subjects whose brightness exceeds the system's limit. Not only is there no definition, but these high brightness areas cause serious adverse electronic effects that the pickup tube introduces into the picture under these conditions. Since the overall brightness range capability of the system is about 20 or 30 to 1 due to our original enemy, the television picture tube, we are quite heavily restricted in the ways that we can include the complete range of subject brightness.

We can slide the scale downwards to increase the detail in the highlights but at the cost of losing information in the lower end of the scale. With only a 30 to 1 range, the end result is an awful picture. We can also alter the transfer characteristics ("gamma," sound familiar?). We do improve the low light reproduction, but we find the range of adjustment is not sufficient to "get" highlight detail. (Engineer's note: the system's signal to noise ratio may be lowered to an unacceptable value.) Other "fixes" using different transfer characteristics within the brightness range have had little success. However, there have been some hardware innovations that decrease the adverse electronic effects caused by extreme highlights.

To illustrate the practical limitations imposed as a result of the above, say we are shooting outdoors on a sunny day. We find that there is not sufficient latitude available to us to expose the shadow areas when dealing with a backlighted subject. The resulting image from the video camera can hardly be described as "photographic." Finding the proper amount of fill light required is most difficult. The amount required usually results in a very unrealistic image with little visual appeal.

The video camera is not forgiving. Careful attention must be paid to controlling the brightness values of all areas. Use the primary area of interest as the reference. The limits are exceedingly narrow. It is necessary to maintain a very precise exposure level on people to insure that we do provide a flesh tone reference. You will also discover that you are always working to the limits of the system's brightness range.

In defending the video image-maker and his ability to obtain the "photographic" result, I hope I have presented the reader, particularly the film image maker, with some understanding in some of the problems associated with obtaining image quality from the video camera. But, beware of the white raincoat, it takes many forms. ■

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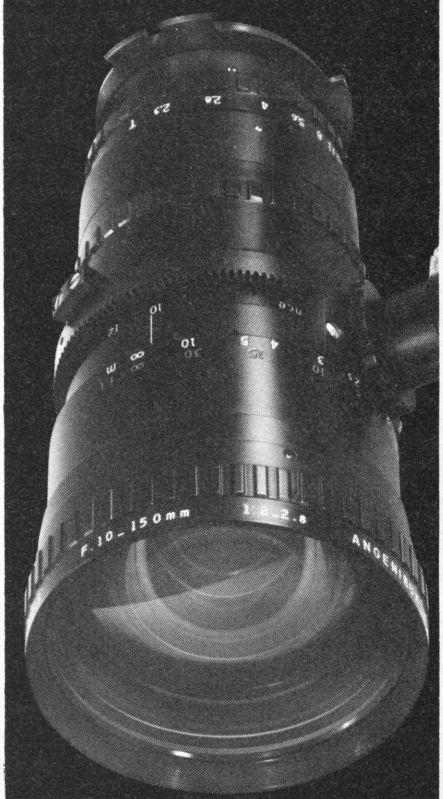

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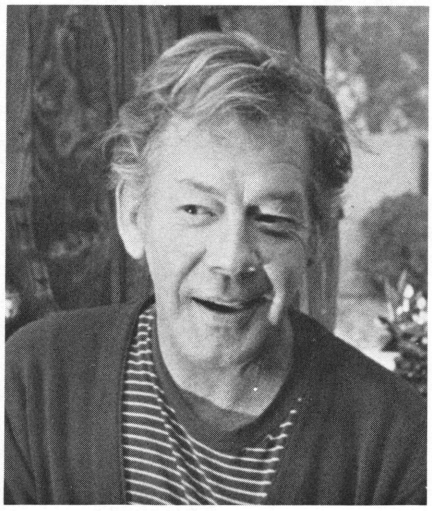
SURVEY OF CAMERAMEN USING EASTMAN COLOR HIGH SPEED NEGATIVE

by ROBERT A. FISHER

A year ago, Eastman Kodak Company introduced a high-speed color negative film recommended for use at an exposure index of 250 in tungsten light. From the start, it has been evident that Eastman high speed color negative film 5293/7293 has a very broad range of exposure latitude, making it useful in many situations where more "film speed" is needed or wanted for practical or artistic reasons.

In a technical paper presented at the annual conference of the Society of Motion Picture and Television Engineers last November, Kodak's Frank Reinking noted some of the potential applications for a high-speed color negative film. Among these, he listed the ability to work at lower light levels in situations where it is impractical or impossible to use more artificial illumination, the reduction of energy and air-conditioning costs on sound stages, the extension of the shooting day by allowing production crews to work later, increased depth-of-field, and special situations,



WILLIAM H. CRONJAGER, ASC

such as high-speed action photography and underwater photography.

Practical experience soon made it apparent that there was another parameter which might be the most important of all: the availability of a high-speed color negative film with a broad range of exposure latitude has given directors of photography a much more sensitive canvas for painting with light.

Over the years, motion picture films have become increasingly "faster" and finer-grained. Whenever this condition is met, directors of photography find new ways to make use of natural or source light while changing their requirements for and use of artificial illumination.

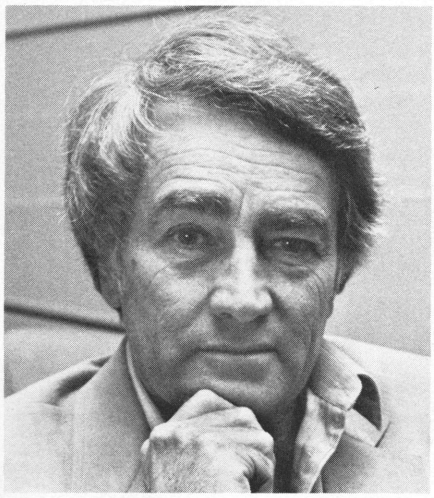
Perhaps what is different about this high-speed color negative is the pace at which new lighting techniques and methods are evolving. The first insights came when a number of cinematographers participated in the production of SMPTE Conference demonstration materials using the new negative under realistic conditions.

Meredith Nicholson, ASC, shot a series of tests during rehearsals of "Mork and Mindy," a three-camera film show. His reaction was that the high-speed film could be rated for an exposure index of 300 to 400, with 50 to 80 footcandles of illumination, without affecting the quality of the image.

Nicholson points out that a high-key "look" is very important to this type of sit-com. The ability to reduce footcandles pays off in energy and air-conditioning cost-savings. The reduced heat also provides a much more comfortable environment for casts and audiences.

John Alonzo, ASC, was preparing to shoot BLUE THUNDER for Columbia Pictures. He shot a series of tests, including a helicopter night sequence, and a rear projection scene. In the helicopter test, he was working with a VistaVision camera with a 50mm lens. By rating the high-speed film for an E.I. of 500, Alonzo found that he could work at T 3.5 or T-4 instead of T-stop 1.8 or 2. He eliminated the blossoming of ground lights which occurred at the lower T-stops, and was also able to hold details in shadow areas. In the process shot, also rating the film for an E.I. of 500,

BILL BUTLER, ASC



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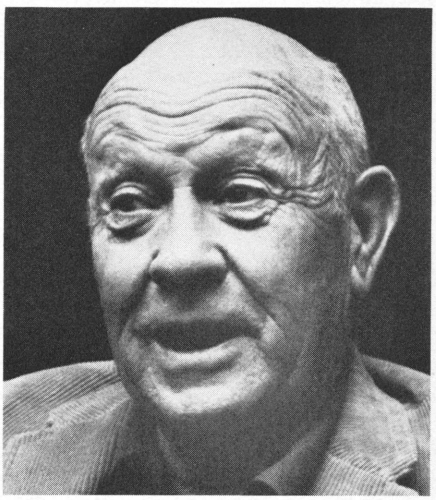

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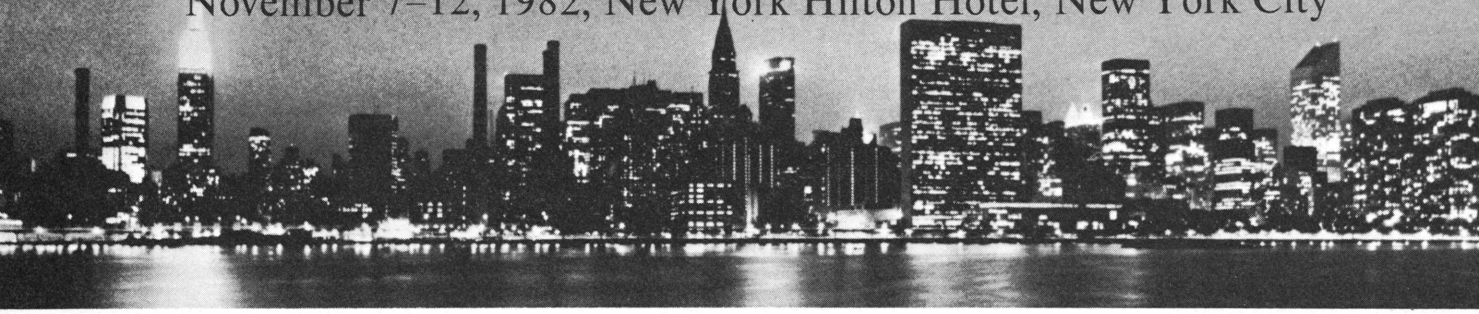


Conference Theme

The theme for the 124th Technical Conference Papers Program has been announced by Program Chairman **Gary Borton,** Eastman Kodak Co. According to Borton, the theme will be **Commitment to Tomorrow's Technology.** In conjunction with this subject, a full list of topics has been selected both in television and motion pictures. Partial lists of topics have been presented in earlier *Journals.* Below is a complete list of topics as of the date of this writing. The television topics are:

International Television
New Technology for Television
Television Audio
Television Post-Production
Video Recording
Future Television Studio Design
TV Image & Signal Evaluation Technologies
Television Production

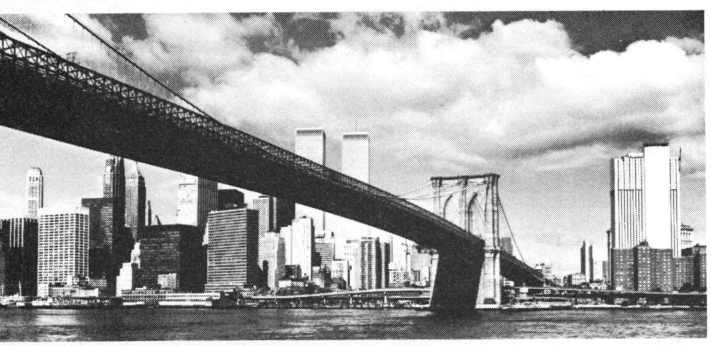
The motion-picture topics are:

Laboratory Practices: New Film and Equipment
Lighting/Projection Practices
Motion-Picture Production and Special Effects
Laboratory Practices: New Technology
Film-to-Tape Interface
Motion-Picture Sound
Historical Papers

New Chairmen Named

Topic chairmen in the field of motion pictures have been appointed, it was announced by Program Co-Chairman for Motion Pictures, Donald F. Breidt, Novo Communications. The chairmen are: *Laboratory Practices: New Film and Equipment*, **Frank Hauser,** Guffanti Film Lab; *Laboratory Practices: New Technology*, **Paul Kaufman,** Du Art Film Laboratories; *Laboratory Practices* (*assisting*), **Neal Pilzer,** Motion Picture Enterprises; *Projection Practices*, **Joe Kelly,** United Artists, Eastern Theaters, Inc.; *Lighting*, **E. Carlton Winckler,** Imero Fiorentino Associates; *Film-to-Tape Interface*, **Mr. Robert Lund,** Robert Lund Associates; *Motion Picture Production and Special Effects*, **Mr. William L. Cooper, Jr.;** *Motion Picture Sound*, **Peter Custer**.

In addition, **Steve Chamberlain,** Arriflex Corp., has been named Topic Chairman for *Historical Papers*.



View of Brooklyn Bridge and lower Manhattan.

SMPTE Conference Vice-President **Charles A. Ahto,** Tape Film Industries, announced the appointment of **Dorothy Eady,** wife of SMPTE Secretary **Harold Eady,** Novo Communications, as Chairman of the *Spouses Committee* responsible for putting together the Spouses' Program at the upcoming conference, and C. Bradley Hunt, Eastman Kodak Co., as *Display Chairman.*

Program Co-Chairman for Television **Richard Green,** CBS, announced his final appointment of topic chairmen on the television side with **Max Berry** for *Television Post-Production.*

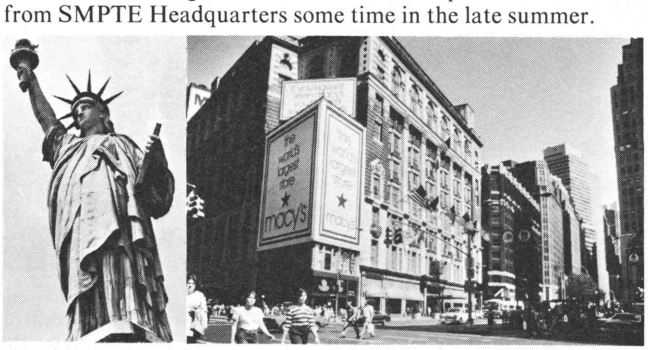
View of exhibit at 1981 SMPTE Technical Conference.

Conference Activities

In addition to what is expected to be a first-class technical program, the SMPTE will feature a full range of additional activities. First, there will be the Equipment Exhibit, which will run from Tuesday, November 9th through Thursday, November 11th. More than 300 booths of motion-picture and television equipment will be displayed on the entire second floor of the New York Hilton Hotel. Most of the major manufacturers are expected to participate in this major film and video equipment extravaganza.

The conference, as usual, will also have an Honors and Awards Luncheon on Monday noon, a cocktail party banquet and dance on Friday evening, a coffee club Monday–Friday morning, and a full week of activities for spouses.

Information about the conference will appear in future issues of the *Journal*. Registration materials are expected to be mailed from SMPTE Headquarters some time in the late summer.



The Statue of Liberty and one of New York's many shopping areas.

Alonzo was able to work at T-5.6 rather than T-2.8 or 3.5 or 4. The result was that the shot looked more realistic.

All of this was good news for the cinematographer since BLUE THUNDER includes many night helicopter scenes, where Alonzo found that he was able to make good use of ambient light while working at comparatively higher T-stops.

Dave Walsh shot a series of tests on a sound stage at Fox, where he was filming I OUGHT TO BE IN PICTURES. Walsh decided that the new high-speed emulsion could easily be rated for an E.I. of 500 without sacrificing image quality when compared to Eastman color negative II film 5247 exposed under the same circumstances.

His analysis: "This provides some interesting new opportunities for story-telling. We'll certainly be able to go on location with less equipment while maintaining photographic integrity. This also opens up new opportunities for using restrictively small practical locations more effectively. Now, with a film speed of 500, we will need less light—keeping the sets cooler, the crews more effective, the actors more comfortable; all in all, better working conditions."

Robert Liu shot a series of tests during rehearsals of "The Lou Grant Show." One of these tests included a night exterior. The scene was staged in a long alley. Liu was working with one baby and one senior light providing around 15 footcandles in the foreground, and two brute arc lights which provided 20 footcandles in the background.

He rated the high-speed emulsion for an E.I. of 500 and used a T-2.5 stop on a 35 mm super-speed lens used with a Panaflex camera. Liu says: "I couldn't see any loss in image quality. I was very happy with the color, the rendition of contrast, the saturation of color and especially the blacks."

His analysis: the high-speed film can be used at practical night exteriors using source light and just a little fill in the 10 to 15 footcandle range.

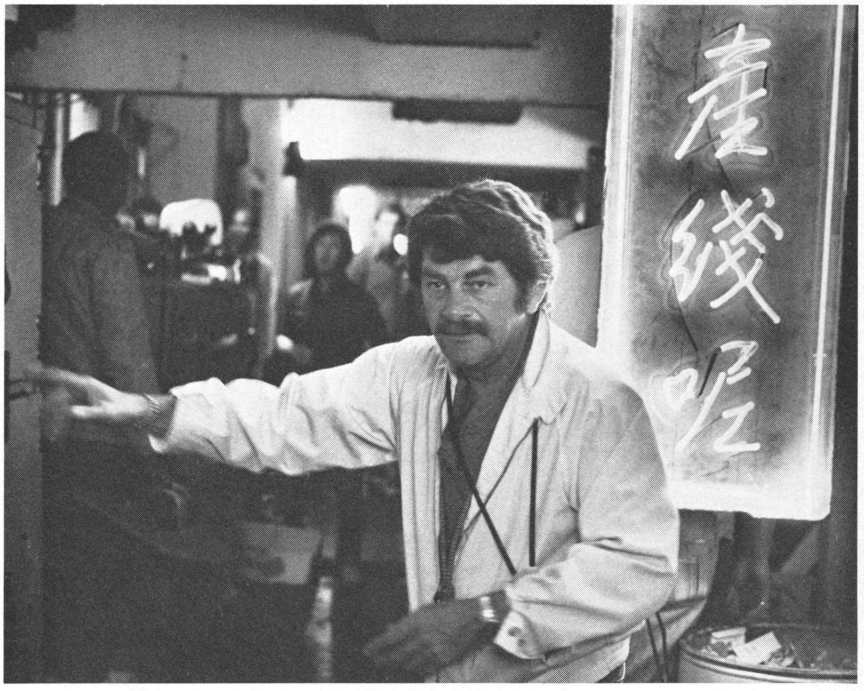
After trying the high-speed film during the production of an episode of "Strike Force," Richard (J.R.) Rawlings, Jr. notes, "(it) really dug into the shadow areas and brought out details which made the scene look more realistic. The film looks at details in the shadow areas just like the human eye does. It discerns between shades of gray."

Rawlings went on to observe that most film lighting is now done for artistic reasons, to help mold a mood. In this context, natural light might be relied upon in special circumstances. However even with the availability of a high-speed emulsion, the creative cinematographer still needs to light to contribute to the illusion of reality. Rawlings adds that smaller lighting units should come into play with the availability of the high-speed emulsion. One pay-off, he says, is that crews will be able to work faster, especially at practical locations.

"I've got to start thinking in terms of 25 footcandles or less, and maybe 15 footcandles or less at night," the cinematographer says.

As more cinematographers gained experience with the use of Eastman high speed color negative film 5293/7293, it became clear that emerging creative imperatives would drive the evolution of new lighting methods and techniques. William (Bill) H. Cronjager, ASC, tells of shooting a scene on stage 16 at MTM Studios where there is a standing set for "Hill Street Blues."

Continued on page 1207



RIC WAITE SHOOTS 5293 ON 48 HRS.

A Special Report

by DEAN GOODHILL

Working with director Walter Hill (HARD TIMES; THE DRIVER; THE WARRIORS; THE LONG RIDERS; SOUTHERN COMFORT) for the first time since THE LONG RIDERS, Ric Waite is shooting 5293 and thinks it is revolutionary.

48 HRS. is consistent with Walter Hill's previous work. It is movie-tough. It struts its aggressive muscularity. It synthesizes its own version of life in the streets and cynical, desperate men doing what they must. Theirs is the code of the professional. Hill's reality is romanticized and simplistic. His macho characters are two-dimensional. But, Walter Hill is a great entertainer. Though Hill's themes and cast of characters are often built on a model created by Howard Hawks, he has made them his own. Hill's camera rarely moves. He never calls attention to himself. His visual style is elegantly simple. He is one of the best young action directors in the business.

48 HRS. pa[illegible] a tough cop (Nick Nolte) with a convict (Reggie Hammond of SATURDAY NIGHT LIVE fame, in his movie debut). Nolte needs the convict's help in track-

Continued on page 1204

SEA SALT

DOCUMENTARY USE OF 7293

by JOHN R. HAMILTON

The filming of SEA SALT, a new documentary by Del Rey Communications for CRC Television, afforded an ideal test of Eastman's newly offered ECH 7293 (5293) high-speed negative stock. Shot last spring as one of the first independent documentary field tests of the emulsion since its market release, SEA SALT put the highly acclaimed negative through its paces in a wide range of situations, from under five foot-candles tungsten and mixed illumination to 7,000 foot-candles daylight.

Some directors of photography have rated the high speed negative at up to ASA 500 normal. In our tests and location shooting, using two different processing laboratories, we did not find that we could honestly consider the stock much higher than its stated ASA 250 (ASA 160 with #85 filter). But . . . how excellent it is to have a fairly low grain film whose normal exposure index is 250. This in itself is an extremely valuable photographic advance. The higher speed allows shooting under the often encountered dimly lit situations of actual life, without having to force process the film and pick up golf balls of grain. Or in low to medium light circumstances, the greater speed permits use of a smaller lens aperture by one and one-half stops over the ECN 7247 negative (ASA 100 tungsten; 64 with #85 filter), thereby achieving greater depth of field, which is an important boon to the helter-skelter exigencies of documentary work.

The film SEA SALT is set against the backdrop of Montreal, Quebec, with its French Canadian flavor, international port, and the special ambience of the waterfront. Here are shipping vessels of fifty countries, discovered as one wends in and out of gates, past guardhouses and on to hidden quays. We see cargo loading, French-speaking longshoremen, and the great container ship operations. A mosaic of nationalities awaits the visitor on board. One Hong Kong registered vessel, the *Cast Dolphin,* for example, had a British captain, a chief officer from India, a Tanzanian second offcer, a Ghanian third officer, a Chinese radio officer, an Irish chief engineer, and a crew from India and mainland China, including Macao.

This veritable floating microcosm is not without its hazards. There is danger in the fierce North Atlantic at all times of year. Even the largest ship is like a matchstick out there. A fifty-ton locomotive could snap a holding chain, roll away to one side, and throw off the ballast, capsizing the ship in an instant. Jane's *Book of Ships* lists over two hundred unexplained disappearances of merchant marine vessels every year.

Into this sequestered and risky world enters Hans Uittenbosch, the ''padre'' of Montreal's Mariner's House, and the port's chaplain as it were. For eighteen years now, since he was 32, this salty Dutch minister of the Christian Reformed Church has been meeting the needs of the lonely men in their isolated nautical ''villages.'' The average age of the mariner is 25. Often they have joined their country's merchant marine to avoid military service or to see the world before taking up a more domestic vocation. Hans, conversant in a dozen tongues, offers them a listening ear, reading material in their own language, and an easy way to make phone calls back home. He arbitrates labor disputes between crews, captains and owners. And of course he reminds the seamen of the fragility of their lives and their need to tune into the God of the Bibles he brings on board.

The harbor chaplaincy has established itself internationally, with a ready access to ships. And thus our crew followed him on and off some two dozen vessels, documenting his unique work amid these forgotten sea-going souls.

Two Yugoslavian crew men speak privately with the ''padre'' in the bowels of the

It was in the dark cabins and dimly lit engine rooms where the 7293 negative really shone. Our cameraman was shocked to see a normal light workprint of a Yugoslavian cabin scene looking perfectly bright and smooth-grained. It was more light and detail than he had seen in the viewfinder. It was even a bit brighter than the room appeared to the naked eye, and yet the lab's timing indicated we were slightly underexposed. With about five foot-candles present, our meter reading showed f/1.0 needed. The Zeiss Distagon lens gives us a T/1.3, which should therefore result in an underexposure of about a stop. But the printer's light points were only slightly below normal, indicating that the 7293 could be considered an ASA 320 or ASA 400 emulsion, if one does not mind routinely printing with a half stop to a stop less light to make it brighter in the print. The stock clearly does have the latitude to go to ASA 500 as a ''normal'' exposure index, if one recognizes that this will actually allow for less than normal range of lab-correctable error if one encounters even dimmer scenes. With negative stocks one should generally err to overexposure, so I feel confident in

ship's engine room where filming was done at t/1.3 with 5 fc of available light.

sticking with my aforementioned ASA 250 rating.

In any case, bounce a 750w or 1000w spot off the ceiling, and you will be working with the comparatively lavish depths of field offered by f/2.8–4.0 instead of the tricky 1.3. With follow focus constantly necessary for unpredictable documentary or actuality work, one still needs to seek for the higher f-stops, even with this miraculous new high-speed stock. Focus must be very precise at the wider apertures; one needs sharp lenses, a bright viewfinder, and an able cameraman.

The critical encounters in SEA SALT came privately with the seafarers and Hans in places such as the deep recesses of a ship's engine room. Hot, humid, oily, well below the water level, these dank areas were inconsistently lit with a few footcandles of tungsten, mercury vapor, and/or flourescent instruments. Sound recording here is another discussion, as one must shout directly in the ear of one's hearer to be heard faintly above the huge diesels' din.

Here again the ECH negative came through. Shooting at f/0.95 (T/1.3), we obtained plenty of brightness, rich blacks and good resolution. The only possible snag again is depth of field. Even wide angle super-speed lenses cannot resolve everything at the widest openings. Therefore choose your focal length and camera-to-subject distance carefully. Alas, even the latest edition of the ASC manual does not give depth of field charts for f-stops below f/2.

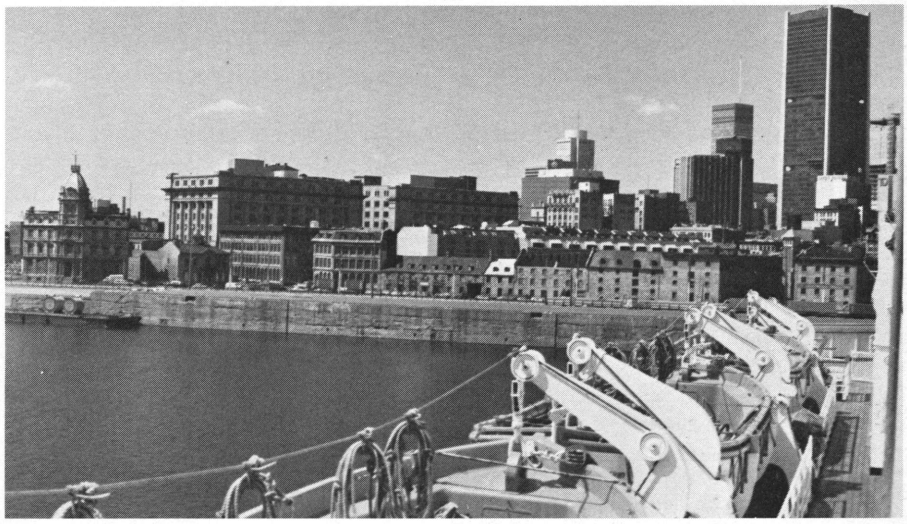
The high-speed negative has less grain than either of the older cinema verité reversal workhorses, EFB (ASA 125) or VNF (ASA 125). So here you get less grain with twice the speed.

Previously ASA 400 could only be obtained with the gritty high-speed video news film 7250. Now we are in the same sensitivity ball park with a better-grained negative. Of course, being a negative stock, it gets dirty more easily and must be loaded into cleaner magazines and cameras, and cut with more care. As for pushing ECH to a true ASA 500 via forced development, we were not pleased with the results of our test. Pushed 7293 gets too grainy although certain documentary subjects may justify it and thus be tolerated by audiences. Forced one stop, one sees noticeably more grain even in the blacks, with lots of grain movement in the color layers of lighter areas.

Another way of effectively gaining more speed in static subjects is to undercrank the camera. Our nighttime shots of the Montreal skyline, buildings, waterfront and city lights were often shot at T/1.3 at 12 frames per second. The results were quite pleasing.

Overall, then, 7293 is at its best when used in low light tungsten situations. It is also fine indoors with a medium amount of daylight through windows and a #85 filter.

Outdoors in bright sunlight the high speed becomes a liability (Cf. "Talking Technically," *American Cinematographer,* July, 1982). One must work with a #85ND6 filter and when the sun pops behind a cloud change back to a straight #85 to avoid the undesireable excess filtration of neutral densities. The ECH stock shows its grain



(ABOVE) The Montreal skyline in bright daylight was shot as T/22 with an 85ND6 filter along with an Eastman 7293. (BELOW) A mariner confides in Hans in the close confines of the noisy engine room.

(ABOVE) Producer/director John Hamilton and cameraman Dave Jousma film the exteriors in the international port of Montreal. (BELOW RIGHT) The night skyline from Montreal harbor was filmed at T/1.3 at 12 fps.

most noticeably in the whites and this is seemingly aggravated under those conditions calling for the #85ND6 filter. After all, 7293 is a little grainier than 7247 and heavy neutral density filtration adds to the image clarity deterioration. Because the grain shows more in lighter areas, and light skies and sunlit bright areas are more likely encountered outdoors, the problem of using 7293 here is compounded. Where such filtration was used by us, the film looked better in more contrasty scenes or with more color-saturated subjects.

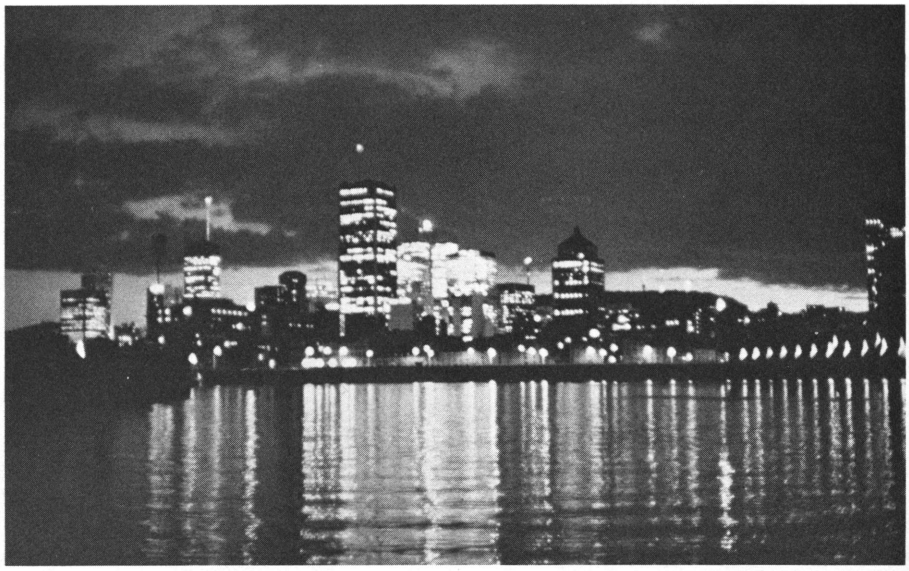
Alternatively to the 85ND6 approach with 7293 one can carry two stocks, which is what I did in directing SEA SALT. The heavily filtered 7293 begins to look too cloudy, magenta and grainy in normal sunlight. We took about one-third of our raw stock in ECN 7247. Two-thirds was ECH 7293, since we expected much of the filming to be in the dark bowels of the ships and figured we could always filter the 7293 if more shooting had to be done outside. Had I been a seer I would have opted for more 7247, since I was rather disappointed with ND-filtered 7293 versus the more outdoor-appropriate 7247. Even the latter's speed must occasionally be brought down with neutral densities.

Carrying two stocks presents its own array of problems and precautions; careful magazine and can labeling, roll logging, and light meter programming are required. For midload changes, one preferably should be using a camera which accepts snap-on magazines with their own footage counters, such as Eclairs. Threading up a CP-16 and losing count of the footage whenever your need to change stock fails to coincide with the 400-ft. point can be a real nuisance. Video enthusiasts may argue at this point that their medium requires no such stock changes or reloads after eleven minutes or less. True, but professional color video cannot really be shot at five footcandles without gain boosts which add noise and look as grainy as force-processed reversal film. Film has the edge in a wider variety of exposure circumstances. Even the ND-filtered 7293 does intercut well from scene to scene with 7247. The audience will not notice the difference. Intercutting angles in the same scene with the two stocks is possible, though not ideal.

In summary, the production of SEA SALT was an opportunity to evaluate the 7293 negative under conditions ranging from extremely low light in ships' engine rooms and Montreal's Metro (subway), to nighttime pictures including light-emitting sources (billboards, lit buildings, etc.), to bright midday sunlight along the waterfront and in the city. The stock was found to be generally at its best indoors or with only a #85 filter. Here the colors are rich and true, the grain fine, and the normal ASA 250 rating a great boon in low existing light. Outdoors, rated at ASA 40 with a #85ND6, the stock is being asked to do something better suited to Ektachrome Commercial ECO (normal ASA 16 with #85 filter). The higher graininess of the new negative stock comes out more in those whites typically found in the sunlit situations of actuality filming.

The 7293 is overall superior in our opinion to the reversal stocks heretofore used for documentaries requiring a fast emulsion, EFB and the VNFs. It is indeed a blessing to have a good resolution film of normal ASA 250 (possibly even up to 320 or 400) without pushing. The stock also provides more exposure latitude and contrast range than videotape. ■

Dr. John R. Hamilton earned his Ph.D. in cinema from the University of Southern California. He is executive producer for Del Rey Communications, as advertising, film and television production firm in Chicago. ■



ographed at The Burbank Studios

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TABLETOP —a

by JIM GILLIE
Director of Photography

As the dawn's surly light trampled its way past deserts and mountains into Hollywood, we rose to our day's task; one perfect product shot. From homes in The Valley and Los Angeles, from apartments at the beach and very elegant hotels we descended on the stage. For the filming that day our stage was not what you might picture as a vast arena designed to create immortal moments of cinema. Ours was a pocket stage. Not much bigger than a two-car garage, in fact I've done this kind of work in a two-car garage before. No. That day our set was five feet wide and three feet deep, with a curved piece of seamless paper rolling upwards to give the illusion of infinite background.

That was the simplest illusion we were to create that day. The illusion that challenged our talents would transform a simple dish of ice cream with marshmallow sauce into a glowing pearlescent mountain of pure green mint dotted with chocolate trees—a shimmering glacier of white cascading down the crevices through the valleys of ice cream and filling the rim of a sparkling crystaline goblet.

A simple task you might imagine. But to face it we assembled a very special team of skilled technicians, each with a personality to match his job. My assistant cameraman, whose hands can perform independent adjustments to the focus and zoom like a flawless computer, had ambitions to producing. He spent half his life on the phone, not simply tracking down work, but tracking the movements of countless other directors of photography and production houses as well as other useful individuals by simply making one call a month to them. This gave him an uncanny knowledge of almost all the shoots that were in action on any given day. Partly as a result of this he had steered me toward a few well qualified producers who were in the preliminary steps of production on feature films. Through my assistant's introduction, I had shown them my reel and gotten the chance to give them some good meeting. All this led to some great job security for my assistant, he could work with me anytime. We had been making a steady thing out of it the past six months or so anyway.

The other departments that were of primary importance to me included a gaffer whose command of the secrets of electricity and lighting gave him a slight arrogance that offset his slightly delayed reactions that added a slightly surly demeanor. His electrical best boy had been found in the back room of an equipment house. He had learned everything he could about the giant brute arc light, properly figuring that would eventually lead to a set. His bachelor's degree in film theory and criticism had fortunately given him the ingenuity to work his way through an equipment house out into the industry.

A gold earring, shoulder length hair and a full beard may have been left over from the Sixties or taken from pirates of yore, but they were just the thing for my key grip. He was a very gentle soul, once you got to know him. His assistant, the best boy grip, resembled a bear in jogging shoes, more than the human he was. But his movement with the precarious and cumbersome equipment was graceful as a ballet virtuoso. So much for the camera, lighting, and grip crews, there were other departments at work on this dish of ice cream.

There were also props and food stylists. Part of our stage was given over to three stoves and four freezers to create the full formal beef Well-

Bit of Light Entertainment

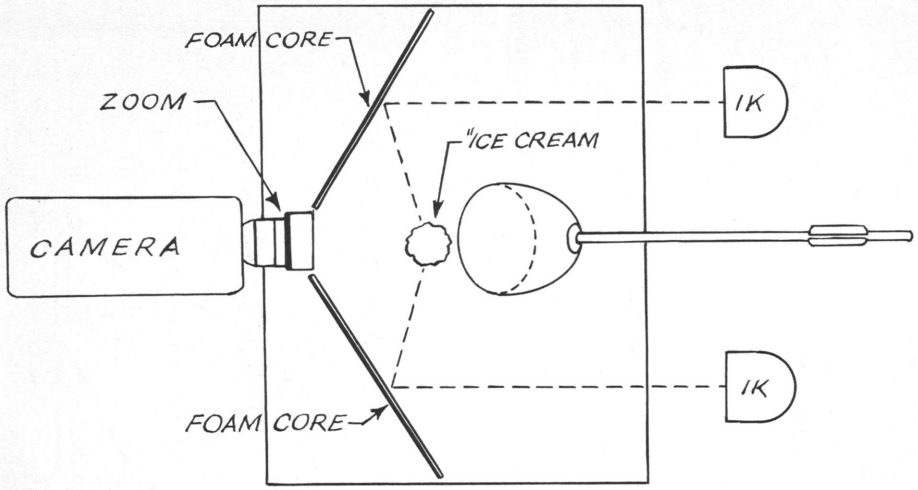
ington that was to be the main course for which our precious ice cream was to be the dessert. Our food stylist wore a gingham skirt and matching smile from the moment she arrived to the moment she left.

The property master and his assistant found a mix between ultra-stylish and practical in their dress and general behavior. They had amassed countless types of goblets and variations on the specified style of place setting as well as a large wooden crate on wheels that carried what seemed like enough equipment to outfit the galley of a trans-Atlantic cruise ship. A little much for one scoop of ice cream, but it proved valuable countless times through the day.

As for me all I brought was a "basher" and my new light meter. A basher is a very simple light. Just a bulb in a parabolic scoop. I had found mine in a salvage yard, and carefully cleaned, polished and rebuilt the fittings. It used to light a parking lot somewhere, but I liked it because it had a better parabola, a wider (18 inch) opening than most commercial models. It only worked with at least one layer of tracing paper over the front to give a soft light with a bright center. I'd added to that a dimmer with an extension cord which let me adjust the intensity from the eyepiece of the camera. I'd found this to be the best formula for tabletop lighting.

The stage was equipped with a lighting package that included 10K's, 5K's, seniors, 2K juniors and 1000 watt babies, so it always amused my gaffer to set up this light with a puny #1 photoflood that was presumptiously called a "basher." But he did it, and it was mounted on a century stand, clothespinned with tracing paper, extended over the table and over the unscrolled seamless paper. This gave us a basic start, a top, back source that could highlight the crest of this mountain and give some shading to the front (in this case north) face of the mint ice cream. I proudly took my new computerized meter out and began to get readings of the light from the crest (f16) to the shadows (f2). Then I began trying to remember which button would give me the calculated right answer.

No sooner had I gotten lost with my new toy than one of the agency people raised a question about the shade of seamless paper. We had unrolled a powder blue (thinking of a sky behind the mountain?), but he pointed out that it clashed with the green of the mint. So before we even had a camera up, our first skirmish of the day was engaged. As the various factions within the agency fought with the problem of background, the director kept placing "stand-in" ice cream in various places and squinting past his touching thumbs. He was trying to find what design he could with the total composition. He'd already formed the opinion that the beige background was his favorite, but like facing a gang in a dark alley, he waited to see who would be the leader of the group. One of the more experienced pros from the agency was busy sampling the Danish on the coffee table. He had made it known in preproduction meetings that he was a connoisseur of Danish pastry, even baked his own on occasion. He watched this early skirmish from a distance as the four or five choices of paper were laid on the table next to the mint ice cream. He walked over to the director and complimented him on the selection of Danish. His agency associates sensed something, grew quiet and turned to their superior, who in turn faced the director and asked, "I don't know, C.B., what do you think?"



The Set Up

The director took a dramatic pause before facing them all and quietly stating, "The blue stinks. And white's all wrong. Personally I like the beige."

The pro nodded, "That sounds good to me." The other agency folk were left to immediately change their allegiances, stick to their guns, or fall back to regroup for the next inevitable onslaught to their artistic accumen. My job was on the line for other reasons, though I saw possibilities for making an attractive picture with the beige.

By now the camera was up and without being conspicuous I was gradually making some sense of the combined digital and analog gadget. So far I'd reckoned my lighting ratio at 97:1. Somehow that wasn't right. I knew it, but I couldn't get this miniature computer to agree no matter which buttons I pushed. So while the prop guys cleaned up the first mess of ice cream "stand-ins," the grips rolled out the beige paper and stowed the blue. We got serious about our lighting. The art of mashed potatoes and modeling clay took on new heights as the prop guys gave us an extremely realistic setting. Food coloring in the mashed potatoes became the green mint mountain with chocolate chips, and white clay basted with water and glycerin gave a shimmer to the marshmallow glacier.

Under the heat it proved a wonder. The best shape for the real "hero" dish could be debated and agreed upon. We had to wade through the table setting, but that became an area of easy concession to those whose egos were most damaged in the prior squabbles. The table setting and its beef Wellington was, after all, only the prelude to the main event of this commercial. Well, that was settled and we progressed. It posed an unusual problem, however, one that cameramen face in any form of work. That was to match a closeup of the ice cream to a long shot of the dinner. And to still be able to get the pour to be perfect in the closeup. To light the long shot, I had to account for an appropriate key. I simply raised the basher a little higher and brought it up on the dimmer. By this time I'd managed to take some sample readings with my new meter: an f8 at the crest and an f2.8 in the darkest shadow. As I pushed more buttons these numbers would disappear and then reappear at their own whim. Enough of this! I brought out my tried and true incident meter and found only 300 footcandles from the basher on the ice cream. With 5247 that was only an f4.5 which wouldn't give me the depth of field I wanted. But the look was good, so I changed to a #2 photoflood, which gave me 600fc or a T6.3. This carried the plate in the foreground and just held the ice cream in the back. By gently tilting the source to a further kick angle, the crest of the ice cream became the brightest lit area of the shot. Which left only the mashed potatoes to fight for the brightest object. The grips added a silk "dot" to shadow the potatoes so they held detail and didn't compete with the ice cream. That left the reflection of the basher in the plate itself. This I checked through a contrast glass, though I still kept aiming my new meter at these areas trying to understand the numbers it produced. I tried to keep an air of imminent revelation about myself, so confusion wouldn't spread to anyone else. Someone once said, my camera assistant reminded me, "In order to take a pretty picture of a girl, you first have to find a pretty girl." So we meticulously arranged the items on the plate to the director's satisfaction, then added one final sprig of parsley to the gleam of light from the far side of the plate. The director shook his head and asked if we had to add that much parsley. I had him look through the eyepiece and see what I was facing, "If we don't, it will overexpose, and draw the eye to that, the brightest point in the frame. It will mean that to print the shot properly, the other midrange values of color and detail will be forced too dark to be appreciated. If we can simply place the parsley in that strategic spot, it will allow the print to be light enough to save all the color and detail that belongs in the other areas of the image." As I prattled on the director was weighing the balance of the image through the finder. He rotated the plate not more than five degrees and tucked the parsley in behind the beef which was now partially killing the glare. When I looked, I felt it was a perfect compromise. We had achieved a pleasing and appetizing dinner that was somehow not stealing attention from the small dish of ice cream. The arrangement settled, I now could add some fill light which I bounced off some 3 foot by 4 foot pieces of foam core which almost touched the lens, as I wanted them to come as close to the angle of view of my camera as possible.

Then there was a cup of coffee which was supposed to be steaming in the area next to our ice cream. To make sure we saw the steam I added a carefully positioned 1000 watt focal spot, which is a lamp with condenser lenses that let the edge of the light be focused. By focusing the light and cutting it just above the rim of the coffee cup, the faintest wisp of steam would glow. To increase this and to give a little more drama to the scene, I had the grips add a cutter to create a shadow from the basher whose soft edge began at the foot of the goblet which held the ice cream, and grew gradually darker as it rose behind the ice cream itself and the rising steam from the coffee. With all that done, I felt we were very close to finalizing a small dolly move which the director and I both liked. The camera start and stop point was agreed upon. The key grip moved the camera out of the way

Continued on page 1200

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GREGG TO

The first thought that struck anyone who met Gregg Toland was that he appeared frail, even ill. He had a sallow complexion, was underweight and walked with a stoop that made him appear older than he was. He seemed to be carrying the weight of the world on his shoulders. When he spoke of the thing that dominated his life—cinematography—the melancholy look vanished. No one could speak more eloquently or knowledgeably or with more enthusiasm. When he was at work, an even greater change took place: he was a dynamo of energy to whom long hours and difficult working conditions meant nothing.

Toland was one of the outstanding cinematographers because he possessed a rare combination of skills, a natural artistic instinct, a determination to deliver the best product of which he was capable, and an enormous capacity for work. All of his work is that of a young man, because his life was tragically brief. His advice to aspiring cameramen was simple:

"Forget the camera. The nature of the story determines the photographic style. Understand the story and make the most of it. If the audience is conscious of tricks and effects, the cameraman's genius, no matter how great it is, is wasted."

He was born May 29, 1904, in Charleston, Illinois. In 1919 he was working as a messenger boy at the William Fox Studio at Sunset and Western in Hollywood. One day he looked up at a cameraman on a high parallel, hand-cranking a Bell and Howell. He decided then that was what he wanted to do. Until that moment he had felt no interest in photography. In a matter of months he became a camera assistant, receiving a raise in pay from $12 a week to $18. His boss was first cameraman on the Al St. John comedies.

The cinematographers at Fox considered him the best assistant on the lot. He worked hard, was bright and dependable, and he stayed nights to polish the camera and lenses. His pay leaped to $60 a week—more than twice what the other assistants were making. He assisted top Fox cinematographers, such as Daniel B. Clark, ASC, who photographed the Tom Mix pictures—and Mix was the highest paid actor in Hollywood.

In the mid-Twenties Toland became second cameraman to another outstanding cinematographer, Arthur Edeson, ASC. A short, wiry man who earned the nickname "Little Napoleon," Edeson had a fondness for shooting from well below eye-level and building strong, deliberately angular compositions. One of the pictures on

(ABOVE) Toland was second cameraman on THE BAT, with Emily Fitzroy, Jewel Carmen, Jack Pickford, Louise Fazenda and Eddie Gribbon. (BELOW) Joan Bennett and Ronald Colman in BULLDOG DRUMMOND, best of the early "talkies."

AND, ASC

by GEORGE E. TURNER

which Toland worked with him was THE BAT (1926), an artistic comedy-mystery directed by the eccentric Roland West and filled with low-angle shots and gigantic shadows. Edeson's influence upon Toland was profound. The settings were designed by William Cameron Menzies, who would be a frequent collaborator—and strong influence—in many of Toland's future ventures.

In 1927, Toland was seconding George Barnes, ASC, another leading cinematic stylist. Among the films on which he assisted Barnes were several Samuel Goldwyn productions, including THE DEVIL DANCER (1927) with Gilda Gray (an exotic dancer from the stage) and THE RESCUE (1929) with Ronald Colman.

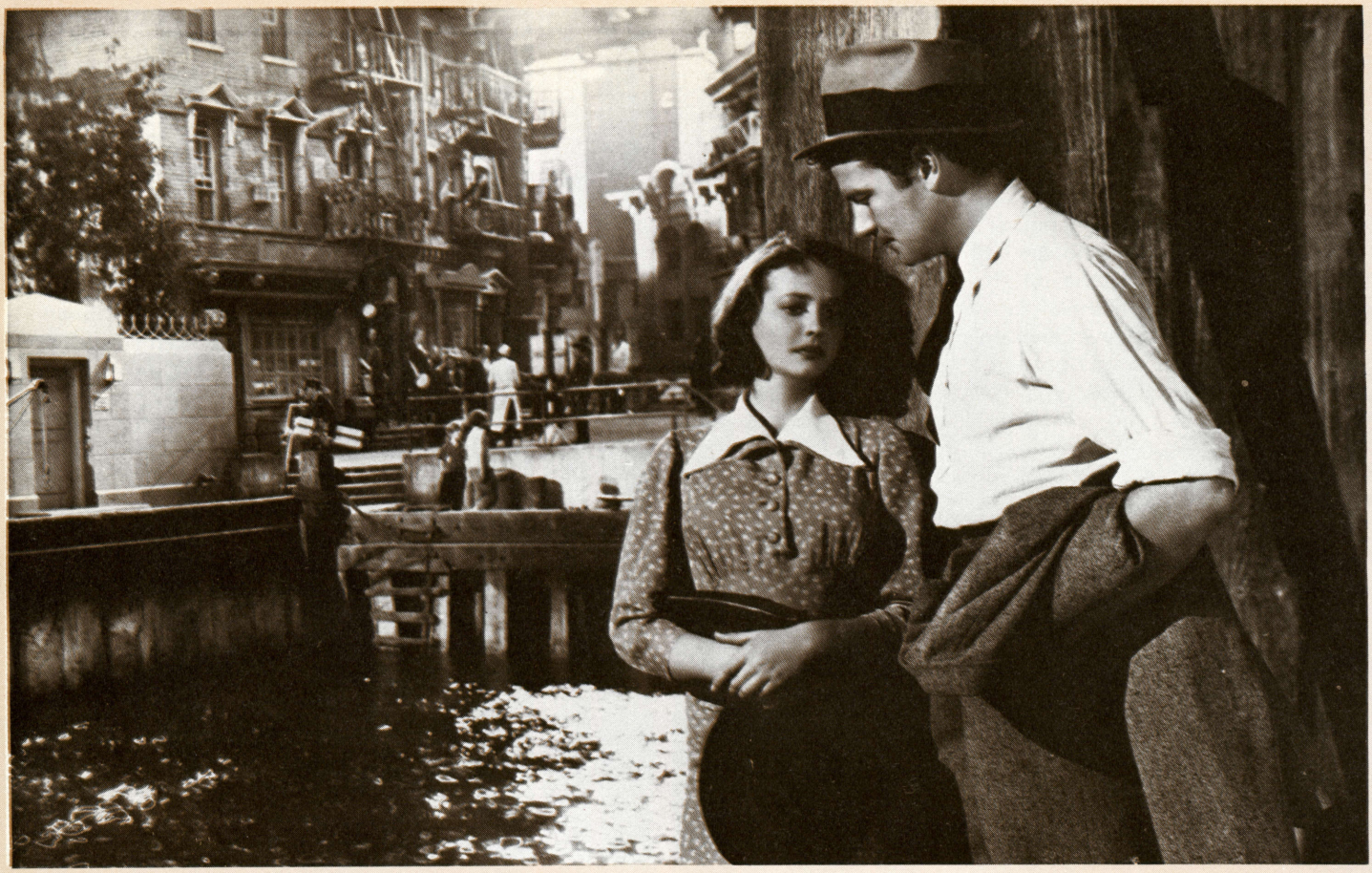
In Goldwyn's THIS IS HEAVEN (1929), an early sound comedy-romance which had a synchronized musical score by Hugo Riesenfeld and several sequences with dialogue, Toland received screen credit with Barnes. He also signed a contract with Goldwyn as director of photography with a salary guarantee of $13,000 per year. The Barnes-Toland team were loaned out to Joseph Kennedy and Gloria Swanson to photograph THE TRESPASSER (1929).

Menzies designed and Barnes and Toland photographed one of the most important early "talkies" for Goldwyn: BULLDOG DRUMMOND (1929), with Ronald Colman. If any picture of the era could be said to justify talking pictures as the dominant form of theater at a time when their future was in doubt, BULLDOG DRUMMOND was it. It had all the photographic artistry of the silent films and outstanding shot-by-shot production design by Menzies. The sound and dialogue seemed as natural as the visuals, and the awful camera stasis that plagued most talkies of the period was nowhere evident. One reason was that Barnes and Toland had designed a "blimp" to silence the camera so that it would not have to be housed in an "ice box" (a heavy, soundproof booth from which primitive talkies were photographed). Other cinematographers were working out ways to silence cameras at the same time (at MGM they were wrapping them in quilts), but the blimp became the standard method.

Other Barnes-Toland collaborations followed at Goldwyn's Studio, the United Artists lot on Santa Monica Blvd. Four of them starred the increasingly popular Ronald Colman: CONDEMNED (1929), RAFFLES (1930), THE DEVIL TO PAY (1931) and the beautifully atmospheric THE UNHOLY GARDEN (1931).

Toland began working without a co-photographer in 1931, both at Goldwyn's and on loan-outs to MGM, Warner Bros. and several of Goldwyn's fellow United Artists members. Among his assignments for Goldwyn were the Technicolor musicals starring Eddie Cantor and the Goldwyn Girls: WHOOPEE! (1930), with added photography by Lee Garmes, ASC, and color direction by Ray Rennahan, ASC; PALMY DAYS (1931), THE KID FROM SPAIN (1932), and ROMAN SCANDALS (1933). All of these were made in the old two-color system, which was effective where absolute realism was not essential. Toland disliked working in color, not only because of the limita-

(ABOVE) The lighting emphasizes the hot spots in a steam cabinet sequence from COME AND GET IT!, with Walter Brennan and Edward Arnold. (BELOW) Toland lighted for both weird drama and romantic comedy in HISTORY IS MADE AT NIGHT, with Charles Boyer and Jean Arthur.



tions of the process but because he preferred to work on more heavily dramatic subjects. At that time, color photography was usually restricted to musicals.

He also was opposed to the "star system" which reigned at the major studios. He had felt that his work on three Gloria Swanson pictures was compromised by the necessity of catering to the glamorous star's appearance rather than the general atmosphere demanded by the stories. He received another overdose of glamour on three pictures with Goldwyn's Russian dramatic star, Anna Sten—NANA, WE LIVE AGAIN (both 1934) and THE WEDDING MARCH (1935). A fine actress with unusual but attractive features, Miss Sten was a boxoffice flop, not only because her heavily accented dialogue was unintelligible to American audiences but because Goldwyn put her in arty, pretentious pictures.

"The star system has us making pictures with personalities rather than stories, sacrificing everything in order to keep some old bags playing young women," Toland said.

At Goldwyn, Toland had a situation that was the envy of other cinematographers. Generally, cinematographers were—and still are—forced to work on most pictures with little or no preparation. Goldwyn put Toland onto the pre-planning team with the director and designers as much as six weeks in advance. Between pictures he was able to work in Goldwyn's experimental lab, devising new lenses, filters and camera gadgets. He was aware of the advantages of his situation and often expressed a wish that his colleagues could work under similar conditions.

Nevertheless, much of his loan-out work is first-rate. PUBLIC HERO NO. 1 (MGM, 1935) is a hard-bitten gangster film which is unjustly forgotten. LES MISERABLES (Twentieth Century-United Artists, 1935) is one of the most atmospheric of Toland's films, with a chase through Paris sewers unsurpassed even by the various editions of THE PHANTOM OF THE OPERA. When Chester Lyons, ASC, died early

(ABOVE) Sylvia Sidney and Joel McCrea on the DEAD END set at Samuel Goldwyn Studio. (BELOW) Romantic fantasy was the dominant note of WUTHERING HEIGHTS, with Laurence Olivier and Merle Oberon.

in the production of MAD LOVE (MGM, 1935), Toland finished the job superbly with no advance preparation. His avowed fondness for the Germanic lighting of the 1920s was ideal for this picture, which was directed by one of the great German cinematographers, Karl Freund, ASC. THE ROAD TO GLORY (Twentieth Century-Fox, 1936), Howard Hawks' penetrating look at cowardice and redemption in the trenches, received a stark, cruelly realistic treatment at Toland's hands. Walter Wanger's unusual HISTORY IS MADE AT NIGHT (United Artists, 1936), gave the cinematographer the difficult task of combining a light romantic mood for a Parisian affair between Charles Boyer and Jean Arthur, some weird atmosphere for Colin Clive as Arthur's insane husband, and a spectacular treatment for a shipwreck.

During the same period on his home lot Toland made such notable films as THE DARK ANGEL (1935), SPLENDOR (1935), THESE THREE (1936) (one of his personal favorites), and about half of COME AND GET IT! (1936), among others.

DEAD END (1937), photographed on a gigantic indoor set of a New York slum that is a vastly expanded version of the one Norman Bel Geddes designed for the stage play, is a fine example of the creation of cinematic truth that transcends literal reality. For THE GOLDWYN FOLLIES (1938), Toland provided some of the best work yet done in the improved three-strip Technicolor. KIDNAPPED (1938), made on loan-out to Twentieth Century-Fox, captures the spirit of Robert Louis Stevenson's sinister adventure yarn better than any of the other versions.

Goldwyn's WUTHERING HEIGHTS (1939) is an important milestone in Toland's burgeoning career. He described it as "a soft, diffused picture, a fantasy." It is filled with candlelight effects, romantic closeups, waving heather, swirling snow and mist. The picture also has its grim side, calling for low angles, dark shadows and occasional deep-focus shots.

INTERMEZZO (Selznick International, 1939), despite its soap-opera plot, became famous as the American film debut of Swedish actress Ingrid Bergman. The actress was rather large-bodied at a time when petite actresses were the norm, so Toland concentrated on exquisitely lighted closeups that captured the natural freshness of an actress who was still a star when she died some 43 years later.

In THE GRAPES OF WRATH (Twentieth Century-Fox, 1940), John Ford's realistic production of the then-controversial John Steinbeck novel, Toland's photographic style matched the stark, hard quality of the writing. He used no scrims or filters to soften the harsh images of seamed faces, bleak backgrounds and sun-baked dryness that so eloquently illustrated the plight of migrants from the Dust Bowl heading toward California in the Thirties. There is no romance or mystery even in the night effects—just cold, sharply delineated reality.

THE WESTERNER (1940), one of Goldwyn's rare Westerns, has a monumental, highly scenic look rendered in sharply detailed shots. Great use is made of backlighted dust, long shadows and sere textures. The beauty of the photography was enhanced in the original release prints by sepia toning and highlight tints.

Still the most artistic of Toland's pictures is THE LONG VOYAGE HOME (Wanger, 1940), a poignant look at the lives of merchant seamen and the beginning of World War II, directed by John Ford. Most of the film takes place aboard ship, which is simulated on a sound stage. There is no suggestion of limitless horizons or open skies, only the small, cramped world of men who live on cargo ships. The tight compositions are carefully arranged, reminiscent of the groupings in Dutch genre paintings. The details of metal, rust and sweat are as eloquently emphasized as the strong features of a great character cast (John Wayne,

(ABOVE) The claustrophobic atmosphere of a merchant ship is palpable in THE LONG VOYAGE HOME. Shown here are Barry Fitzgerald, Constantin Romanoff, Thomas Mitchell, Ward Bond, Wilfrid Lawson, John Wayne and John Qualen. (BELOW) The Joad family and friends in THE GRAPES OF WRATH included Eddie Quillan, Dorris Bowdon, Henry Fonda, Jane Darwell, Russell Simpson, Frank Darien, O.Z. Whitehead and John Carradine.

Thomas Mitchell, Ward Bond, Ian Hunter, Barry Fitzgerald, Wilfrid Lawson, John Qualen). It is likely that Toland's fame would rest largely on THE LONG VOYAGE HOME, but another loan-out, this time to RKO-Radio, resulted in the picture which virtually eclipsed his earlier efforts.

Toland's most celebrated—and most controversial—film is CITIZEN KANE (1940), which marked the feature directorial debut of a young man from radio and the theater, Orson Welles. A part of the controversy surrounding the picture was generated by an antipathy toward Welles by many industry veterans, who understandably felt that the last thing Hollywood needed was one more "boy wonder." One noted wit at the RKO-Radio studio remarked, as Welles strolled past, "There, but for the grace of God, goes God."

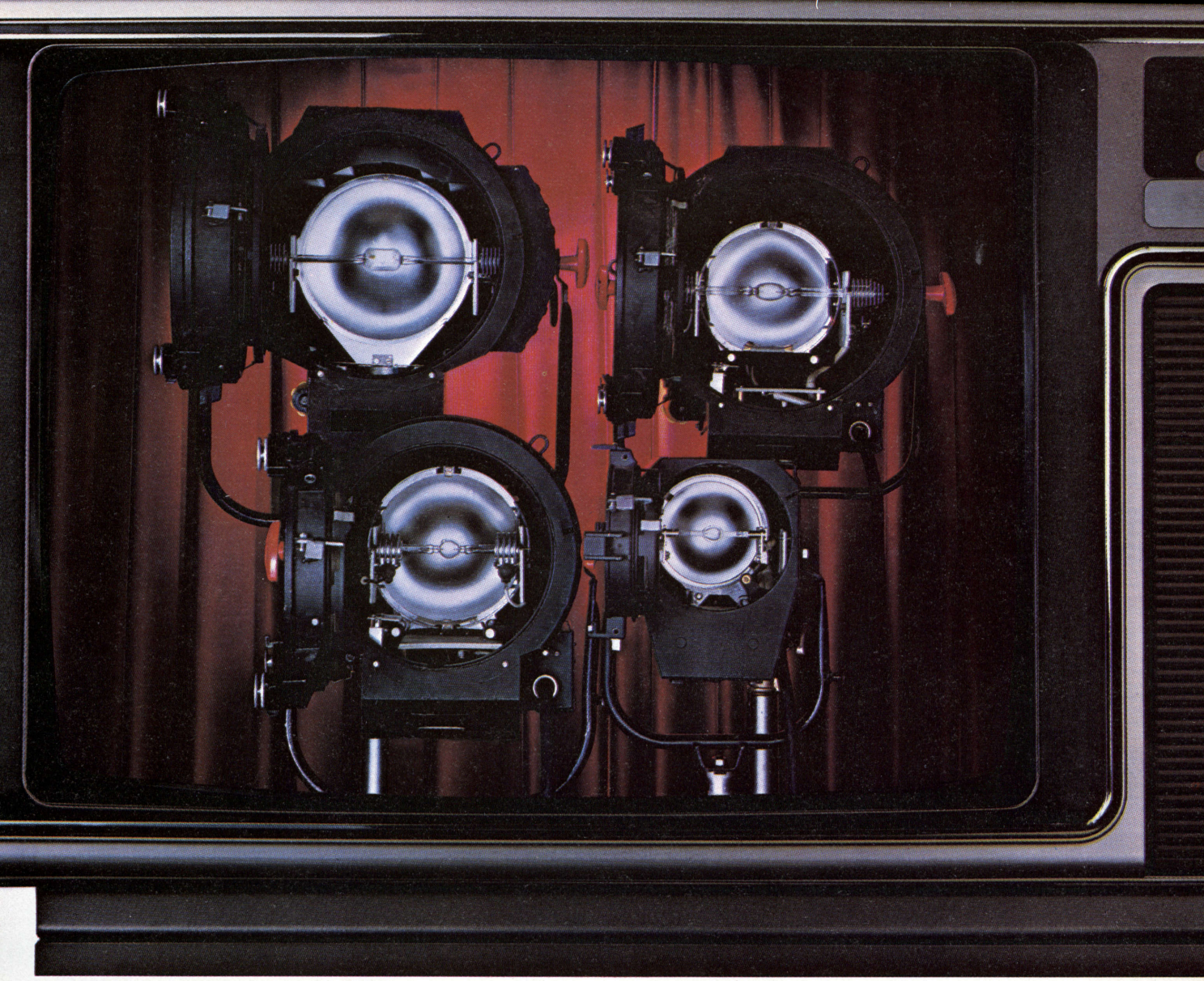
The press was generally unkind, although they lavished a great deal of attention on Welles' mysterious project at RKO, which at various stages was expected to be an adaptation of Joseph Conrad's HEART OF DARKNESS and a thriller called THE SMILER WITH A KNIFE. When gossip columnist Louella O. Parsons learned that Welles's picture would be about a millionaire newspaperman who built a fabulous castle and collected tons of statuary from all over the world, Hearst Enterprises banned mention of Welles or his production in Hearst newspapers and King Features' syndicated columns.

When CITIZEN KANE at last was released, the subject matter aroused less controversy than its visual and aural aspects. The general public despised the picture because it seemed "freakish" with its startling compositions, unexpected sounds and generally unorthodox approach to storytelling. Many cinematographers objected to its eclecticism, feeling that it eschewed the pictorially beautiful techniques that had evolved over several decades to return to the old ideal of crisp, detailed images.

It seems incredible today that this much admired favorite of television

Continued on page 1221

(TOP) Even the "ordinary" scenes of CITIZEN KANE are striking. Joseph Cotten, Orson Welles and Everett Sloane are photographed from a low angle against a muslin ceiling. (CENTER) Herbert Marshall and Bette Davis—in her white makeup—in THE LITTLE FOXES. (BELOW) A frame from THE BEST YEARS OF OUR LIVES. Prominent in the grouping are Dana Andrews, Teresa Wright, Myrna Loy, Fredric March, Harold Russell, Cathy O'Donnell and Dorothy Adams.



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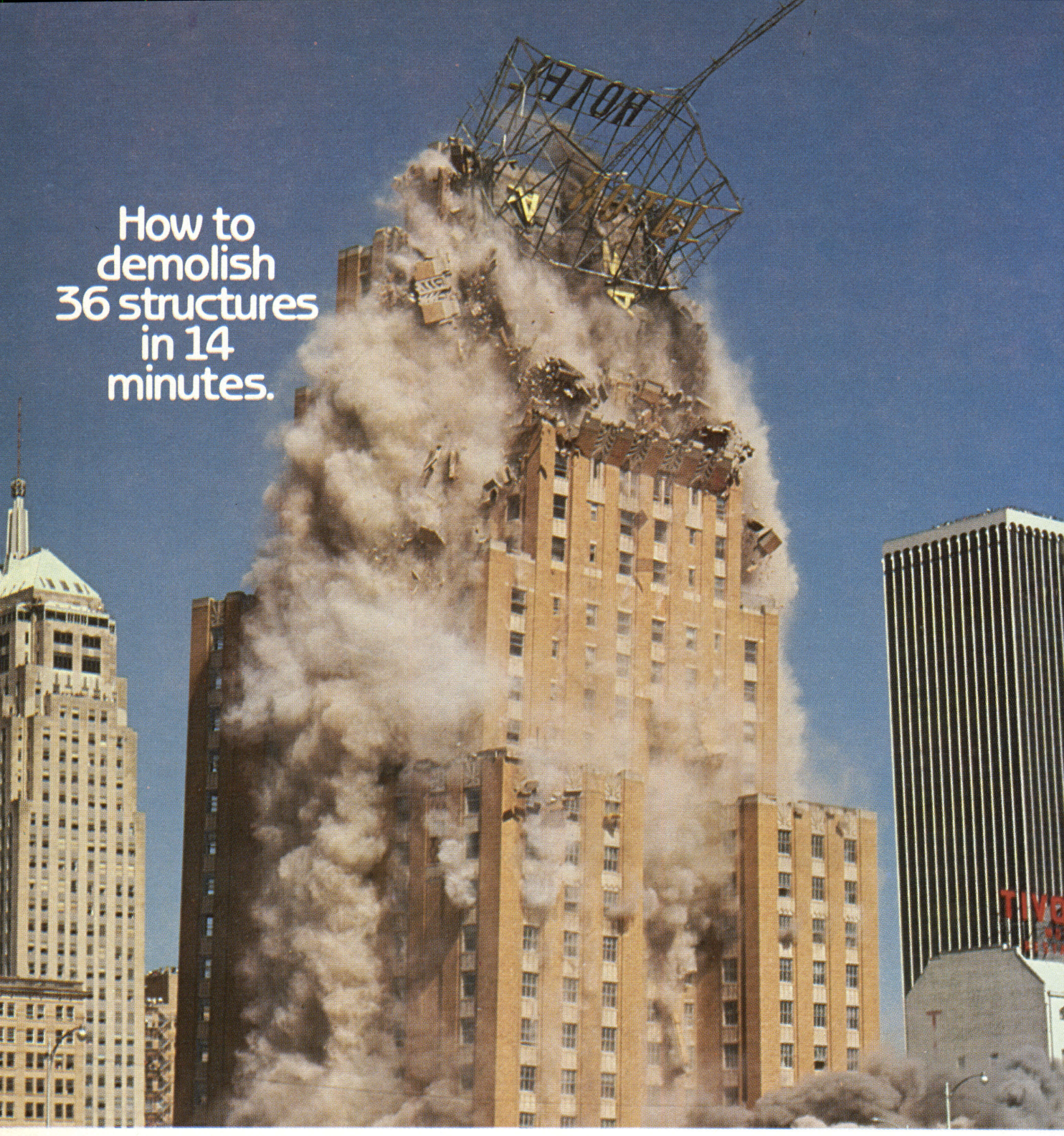

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CINEMATOGRAPHERS AND LIGH

OUTSTANDING CINEMATOGRAPHY FOR A SERIES

For a single episode of a regular series

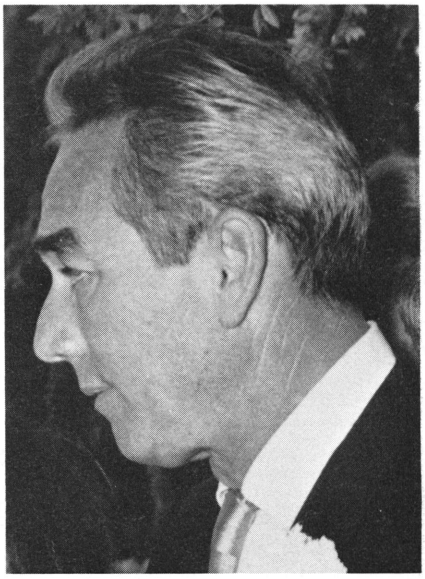
William W. Spencer, ASC

FAME—ALONE IN A CROWD

Two cinematographers and two lighting directors were honored by The Academy of Television Arts and Sciences at their 34th annual Emmy Awards Banquet on September 12. The selections were made from a total of 405 hours of nighttime programming.

William Spencer, who entered the film industry at MGM 43 years ago, learned his craft under some of the great cinematographers, such as John Alton, Joseph Ruttenberg, George Folsey, Russell Harlan and Paul Vogel. He has been a director of photography for more than 20 years. His sensitive camera artistry is a conspicuous reason for the popularity of FAME, a fast-moving series in which the talents and personalities of a large variety of young performers are given full play. The award-winning segment, ALONE IN A CROWD, is particularly memorable for some athletic ballet sequences photographed under difficult conditions in a rehearsal hall setting.

Other nominations in this category were Robert F. Liu for LOU GRANT—GHOSTS: Sol Negrin, ASC for BAKER'S DOZEN—ALL BY HIMSELF; Woody Omens for MAGNUM, P.I.— MEMORIES ARE FOREVER; and Ted Voightlander, ASC for LITTLE HOUSE ON THE PRAIRIE—HE WAS ONLY TWELVE, Part Two.



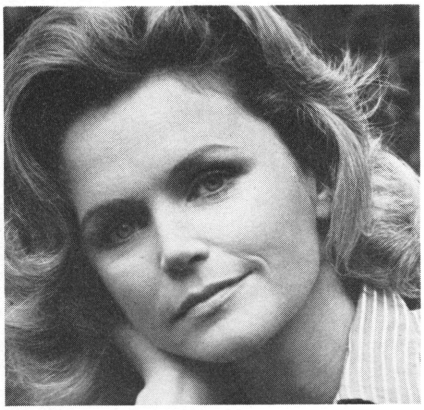
Spencer

OUTSTANDING CINEMATOGRAPHY FOR A LIMITED SERIES OR A SPECIAL

For a single episode of a limited series, or for a special

James Crabe, ASC

THE LETTER



Lee Remick, star of THE LETTER

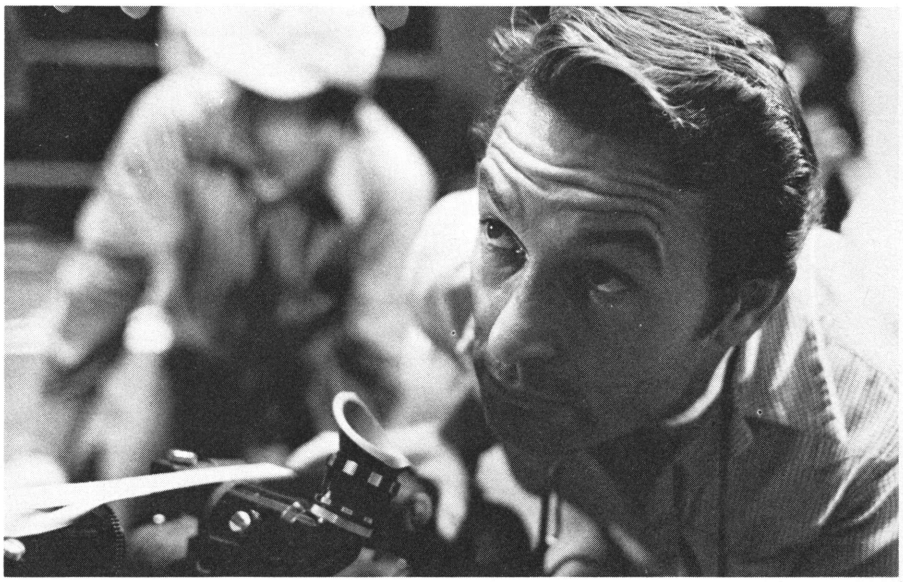
The high quality of many of the two-hour features made especially for television is remarkable considering the circumstances under which they are made. Most are filmed in two weeks or less with little opportunity for pre-production preparation by the cinematographer. Yet, many of them are of a standard comparable to most theatrical films which are made on far more generous budgets and shooting schedules.

TV feature production can only succeed when highly skilled craftsmen are in charge. Although James Crabe is one of the younger directors of photography, he has the kind of know-how that leads to a quality product. He photographed the critically acclaimed SAVE THE TIGER, THE FORMULA (which brought him an Oscar nomination), and the enormously popular ROCKY, for example.

TING DIRECTORS WIN EMMYS

THE LETTER, based on the W. Somerset Maugham novel, is a classic of atmosphere, evoking the sultry environment of a tropical plantation and the stifling closeness of a courtroom to excellent effect. The television version does not emulate the styles of either of the celebrated theatrical versions of the story, in which Jeanne Eagles (1929) and Bette Davis (1940) were starred.

Other nominations in this category were Pasqualino De Santis for MARCO POLO Part Four, and Gayne Rescher, ASC for THE PRINCESS AND THE CABBIE.



Crabe

OUTSTANDING ACHIEVEMENT IN LIGHTING DIRECTION

For a single episode of a regular or limited series, or for a special

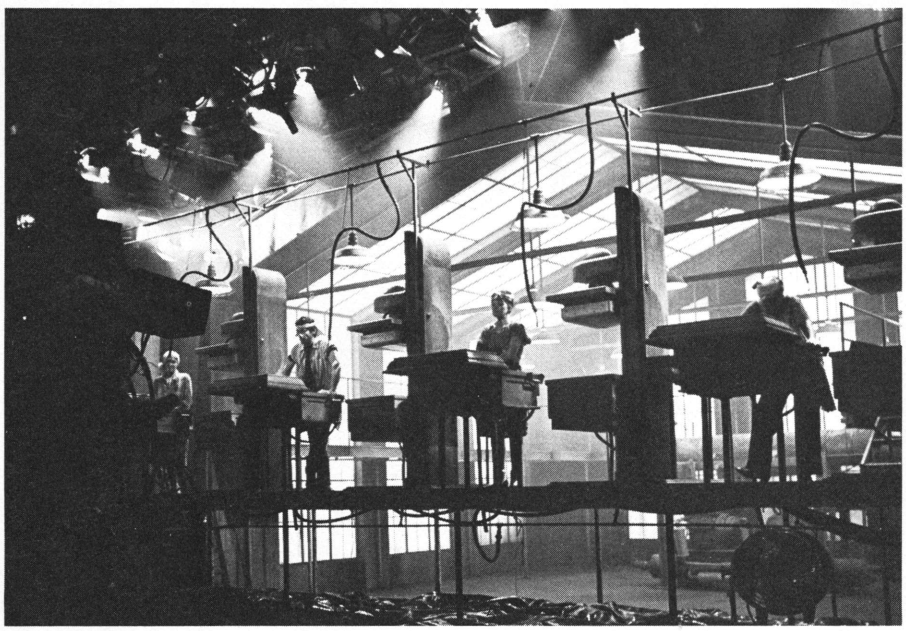
George W. Riesenberger, Lighting Designer
Ken Dettling, Lighting Director

WORKING—AMERICAN PLAYHOUSE

A 90-minute adaptation of a stage musical, WORKING was taped at KCET-TV, Los Angeles PBS station, in seven days. The frantic schedule notwithstanding, the show was notable for the variety and the imagination of its lighting. The production required a large number of sets, all of which were constructed at the studio, which included a kitchen, a classroom, a steel mill and an ''outdoor'' setting of a migratory farm workers camp. Such illusions as the glowing heat of the mill and sunset at the work camp were achieved through ingenious lighting.

Others nominated in the category were Gregory Brunton for DEBBY BOONE . . . ONE STEP CLOSER, Leard Davis for NASHVILLE PALACE, Bob Dickenson and Harold Guy for SOLID GOLD, William Klages for NIGHT OF 100 STARS, and Fred McKinnon and March Palius for I LOVE LIBERTY.

Dettling



Riesenberger

KCET photo (LEFT) by MITZI TRUMBO.

Tough Rolux

How to use Rosco's Tough Rolux for a little diffusion. Or a lot of diffusion. Or a spot of diffusion. Or anything in between.

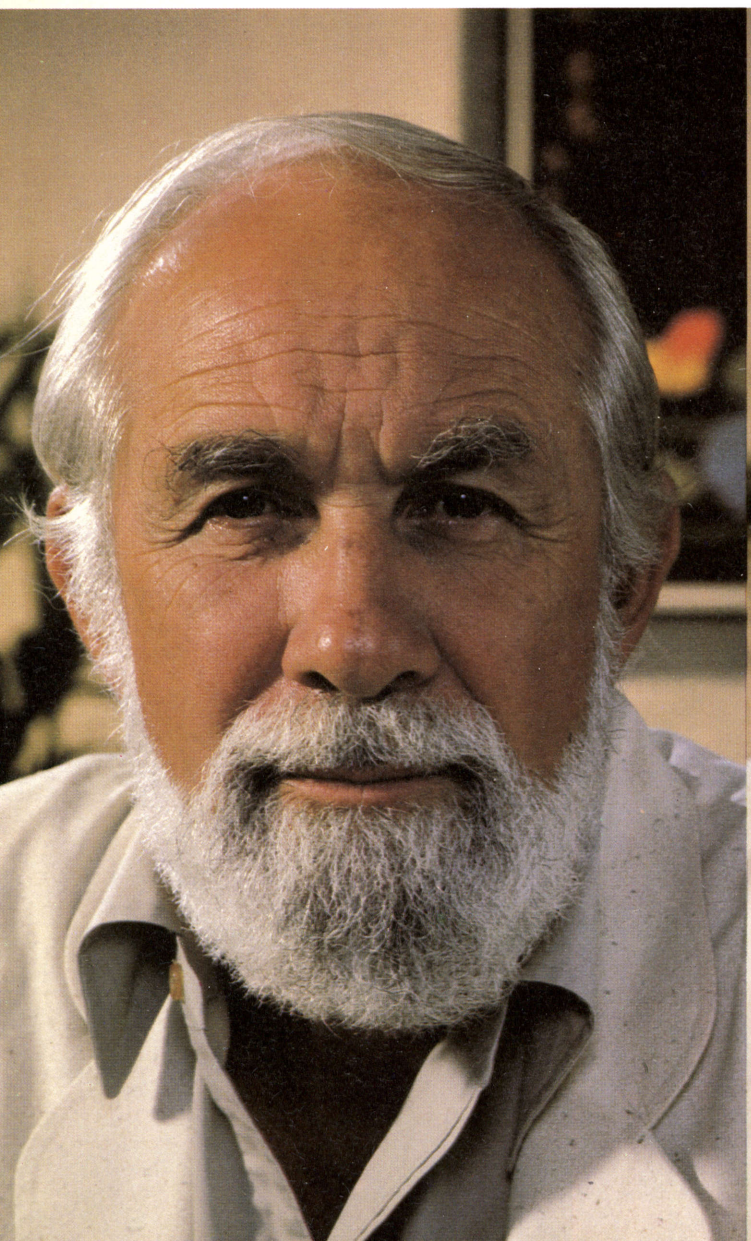
There's no limit to the texture of lighting you can achieve when you keep rolls of Rosco's Tough Rolux on your set.

William Fraker, who directed and then posed for the pictures below, suggests four techniques for Tough Rolux diffusion... all geared to getting the desired effect in a particular situation.

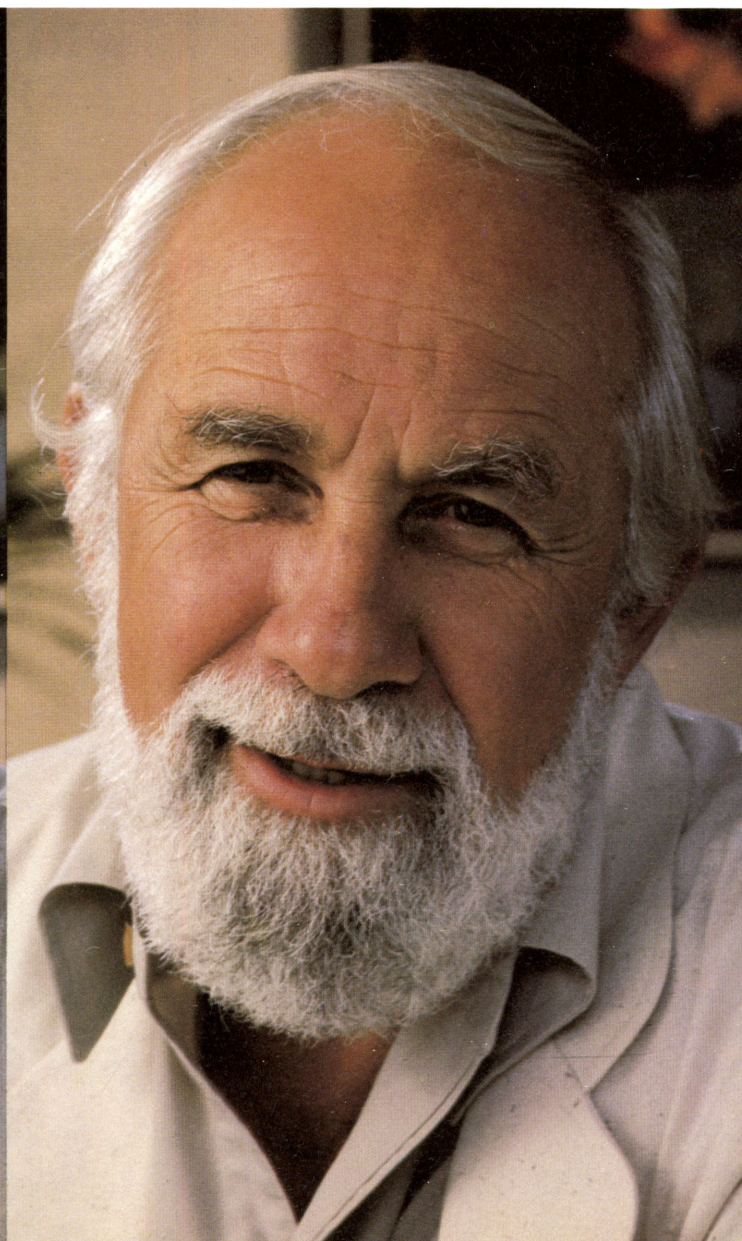
Rosco calls the material Tough Rolux because it's tough enough to stand up to hot lights. Each roll of Tough Rolux yields 100 square feet of material. It can be used in the gel frame of a light fixture, or rolled out in large sheets in front of a bank of lights. Fraker, and other filmmakers, have used it as a tent, shredded it, cut holes in it – and even used it as a white reflective surface for bouncing light.

As versatile as it is, Tough Rolux is only one of 16 useful Rosco diffusion

Shredded Rolux



Framed Rolux



materials. You'll find them all at your rental house or Rosco dealer.

Fraker on diffusion
Rosco asked Bill Fraker to demonstrate in print four techniques for diffusing light with Tough Rolux. He lit the scene with four HMI fresnel units in flood position. Because he prefers a mixture of hard and soft light, Fraker left one hard light without diffusion throughout all the photos. It was positioned behind his right ear.

Shredded Rolux
Because Tough Rolux handles heat so well, it can be used directly on the luminaire. In the first picture below, 3" vertical slashes were cut in the Rolux and inserted into the color frame of the key light. This technique helps bring out the texture of skin tones, adding life and character to them.

Framed Rolux
Tough Rolux was clipped into a 4 ft. square grip frame and positioned 5 ft. in front of the key light which was opened to full flood.

Tented Rolux
For overall soft light, nothing has quite the effect of building a tent with Tough Rolux. The individual light sources (three used here for soft front lighting) virtually disappear and the full "tent" becomes the effective source.

Slit Rolux
For a dramatic highlight, Fraker had a slit cut into Tough Rolux so the hard light punched through to provide an arresting accent.

About Bill Fraker
William A. Fraker, ASC, has just completed directing "The Legend Of The Lone Ranger." A four-time Academy Award nominee, he photographed such films as "Heaven Can Wait", "Looking For Mr. Goodbar", "Rosemary's Baby", and "1941". He is past president of the American Society of Cinematographers and a member of the Board of Governors of the Academy of Motion Picture Arts and Sciences and the Executive Board of IATSE Local 659.

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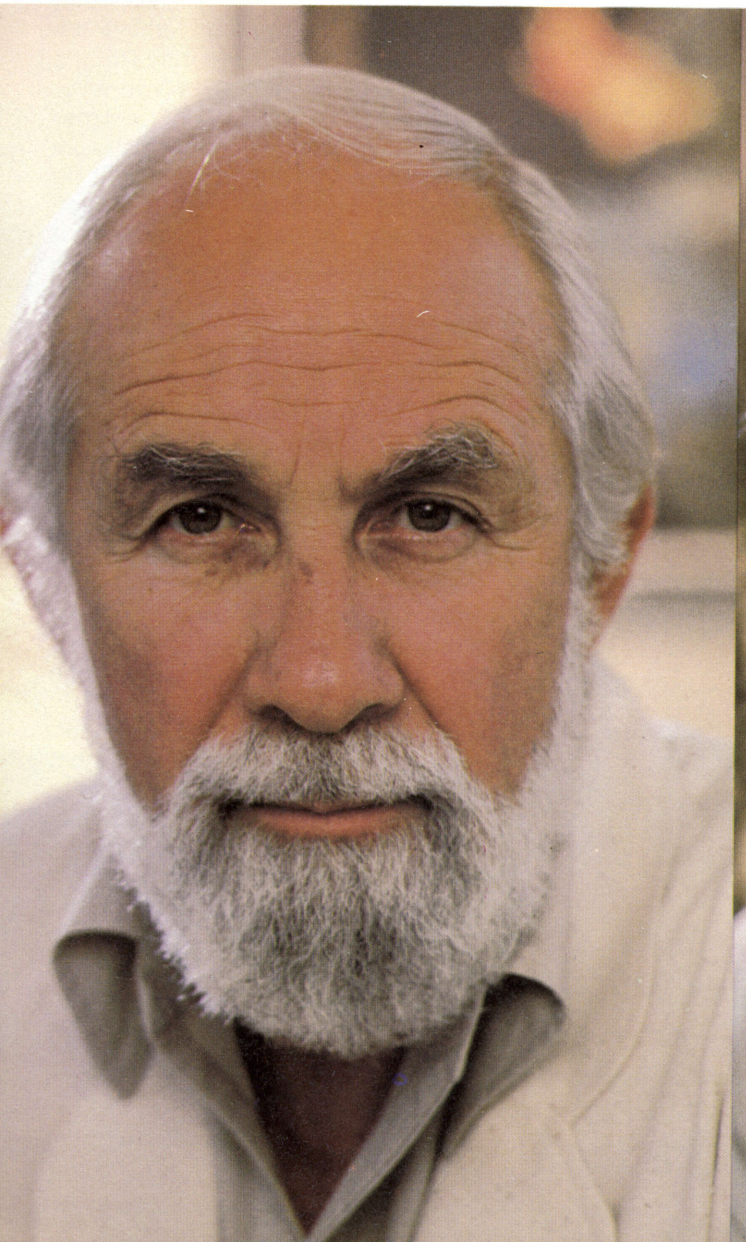
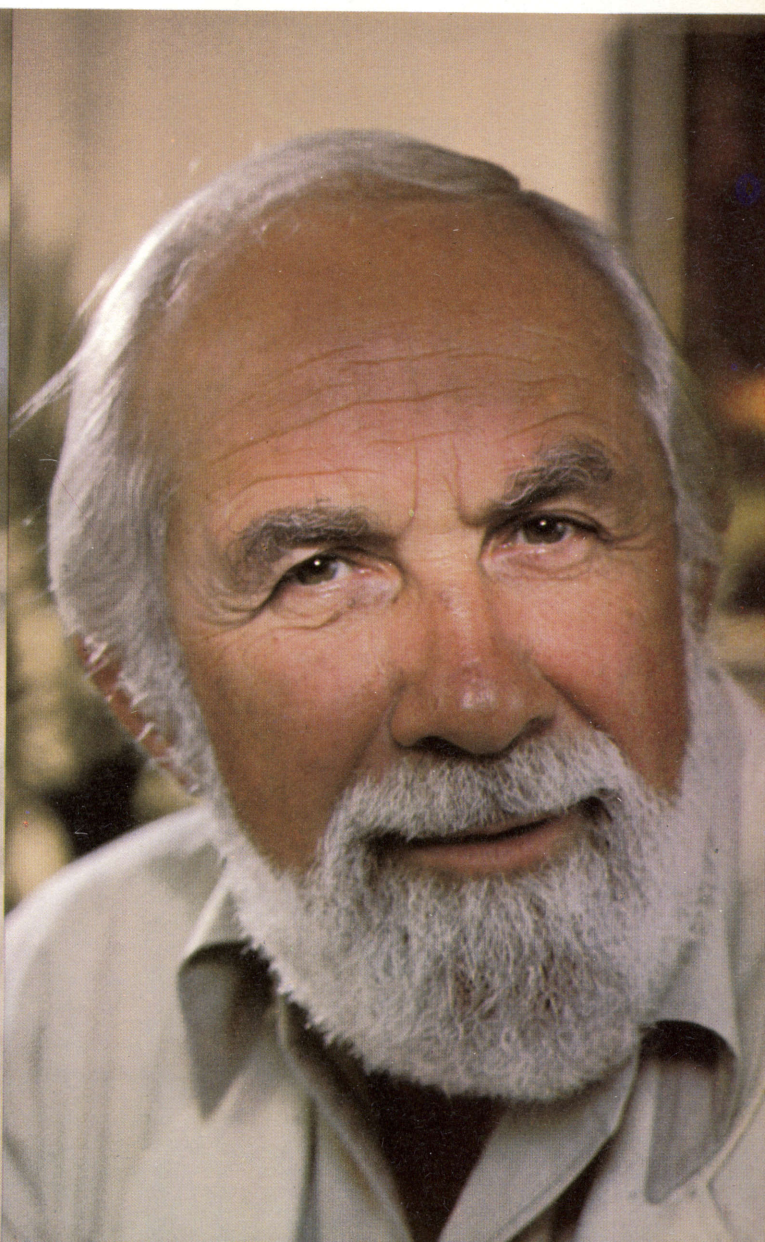
Tented Rolux



Slit Rolux



LIGHTING AND PRODUCTION DESIGN

When selecting a location or designing a set the effect of light plays a big role in the choices you are going to make, according to Production Designer Richard MacDonald. At Monterey, he says, ''the sea is best on the south side of the peninsula because it is all back lit . . . you get that lovely light off it, the waves come up and capture the sunlight.'' However he goes on to say that on the Cannery Row side the sea is flat and has no dimension. In designing a set MacDonald says that surfaces are ''set at angles and roads molded for puddles to reflect light . . . this is what you can do for the cameraman.''

Cinematographer Phil Lathrop, ASC, agrees that ''a lot of lighting depends on how the set is built'' It is immediately apparent that cooperation and understanding is essential between the production designer and the director of photography, although each has his own areas of responsibility. The production designer interprets the director's concepts, designs the sets, gets them built and dressed, and coordinates the costume designs. The director of photography lights the sets and brings the whole thing to life on film. As Jordan Cronenweth observes, ''One is really an extension of the other.'' He feels that this was especially true during the production of BLADE RUNNER. ''It's the closest collaboration I've ever had.'' Veteran Production Designer Boris Levin commented that in the old studio days, a cameraman might be assigned just ahead of production and many times he didn't care about what the designer had in mind. He would light the set by formula just to get the job done. However, today, as John Alonzo, ASC, points out, there is a ''free flow of ideas, a creative process'' between the two departments. ''He either modifies the set or I modify the lighting.''

Both cinematographers and designers agree that ideally the director of photography and the production designer should consult from the beginning of pre-production. Usually, for budget reasons, the director of photography doesn't start until about one month before shooting begins. By that time most of the sets are underway or have been completed. Most production designers seek input from the cameraman ahead of that time. They call or have the cameraman come in for a couple of days.

Albert Brenner says ''I just ask up front, Do you have any specific likes

(ABOVE) Shafts of light in fog are used in BLADE RUNNER in a manner reminiscent of CITIZEN KANE. (BELOW) The omnipresent neon lighting in BLADE RUNNER was supplemented by 10K lighting ringing the streets. This lighting motif dominated the film.

by JAE CARMICHAEL

A beautifully night-lighted set from CANNERY ROW.

or dislikes? Is there anyway I can help you?'' When the blueprints have been drawn up, Brenner sends the cameraman a full set so that he can become familiar with the physical dimensions of the sets and identify any problems at that time.

Sven Nykvist, ASC, says that in Sweden the director, the cinematographer and the production designer all work together during preproduction, establishing the design concepts, scouting locations, and solving problems so that ''when we start shooting we don't have any surprises.'' He feels that it is less expensive that way ''because we don't have to have a big crew during production . . . and we usually shoot a picture in 42 days working 9 am to 5 pm. Even so . . . I love it in America, whatever I ask for they say nothing is impossible . . . its such a positive attitude.''

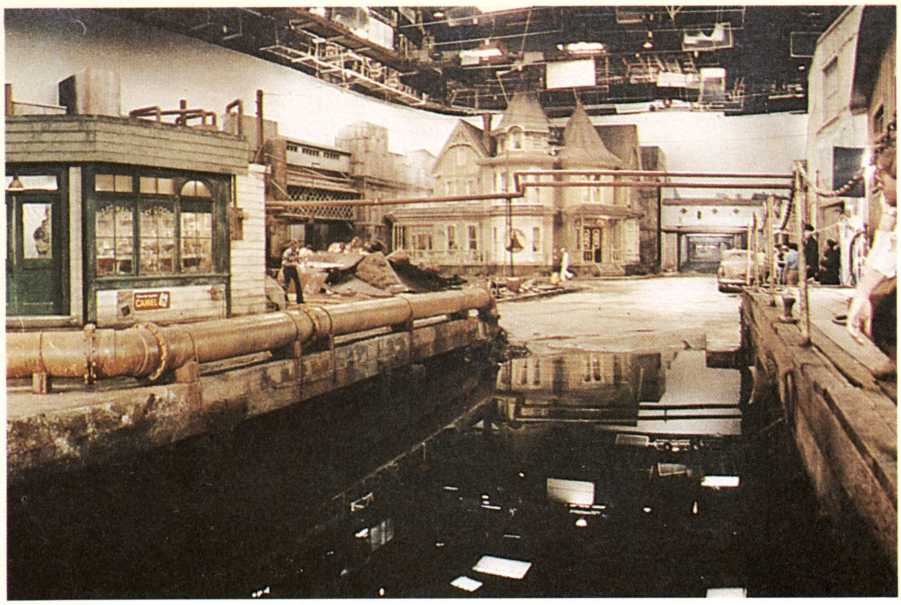
On the other hand. Alonzo feels that perhaps it's better to let the production designer be unencumbered, with only the director's input at first. ''Actually you can't see the geography and what the sets will be until they are built . . . When I arrive my contribution is aesthetic and technical.''

Actually, as Lawrence Paull points out ''the most important time for a production designer is in pre-production when he has the ear of the director totally. Brenner echos this when he says ''All my input is put in at the beginning of the picture and then when the director of photography comes along he has the director's full attention . . . If I've been successful I've got my licks in at the beginning and the director now transfers those to the director of photography.''

The design process begins, after reading the script, with in depth discussions with the director. As Brenner says, ''the first images come from the director and then it becomes my problem to put them down graphically so everyone can see what he means.'' Through sketches, pictures from magazines, old photos, whatever, the ambiance of the film is generated. As a result of all this input the design concept for the film is established. For instance Richard Sylbert in discussing ''Reds'' said that since 1919 was considered a ''brown era'' there would only be tones of brown, except of course for the critical color red. Also it was decided to let the windows ''burn out'' in keeping with the old photos of that time. Not only was there a philosophical reason for these design decisions but a practical one too, since it made it much easier to match sets to locations and saved the cameraman time as he did not have to balance exterior to interior lighting.

One of the design concepts for BLADE RUNNER was bright neon against a drab background of buildings. As this concept involved both lighting and set construction, Cronenweth came in for the meetings. Paull wanted to have a ''harsh, murky look'' with ''additive architecture'' that created a ''sculptured appearance with a lot of texture.'' Vacuum-formed pipes were applied all over the exteriors of the buildings and everything was painted in ''elephant colors with pastel highlights.'' Since the Director, Ridley Scott, had also had experience in art direction and camera, he had definite ideas of what he wanted. Both Paull and Cronenweth felt that the collaboration was a good experience. As Paull put it, ''it posed opportunities'' for expansion of concepts and ''contributed to the visualization of the film.'' For example one of the design motifs of the film was shafts of light. (See July 1982 issue AMERICAN CINEMATOGRAPHER) According to Cronenweth, ''Ridley liked the feeling of shafts of light in CITIZEN KANE, so we used them for the first time in the Tyrel Corporation scene. Ridley loved it but how could we justify it in other scenes? The next scene where we wanted to use this motif was in the Blade Runner's apartment. It was decided to justify it by establishing the light sources as advertising on the side of the dirigibles floating around outside.'' Thus some of the most stunning images in the film evolved from this creative process of problem solving.

Each production designer has his own method of generating the design concept for a film. Sylbert does it by thinking of a piece of music. ''I not only think of music, I think of how you would write it, what instruments would be used, whether its a symphony, or a concerto or a sonata, what century is it, whether its classical or romantic. FRANCES is romantic. When I did CHINATOWN I did a little concerto, brass, very carefully done. When I did CARNAL KNOWLEDGE it was definitely chamber music with four pieces . . . I'm interested in how you structure time and space and how to use harmonies and repetition. I design the movie with a very special vision in mind. A part of it belongs to every other part of it. My whole assumption about design is that it is about structure—a set of relationships where the parts make the whole.'' In FRANCES, which is a



story about a girl who is constantly going home, Sylbert built the design around the musical structure of "going home," A-B-A-C-A-D-A—that is the concept, starting with one motif then to another then back "home" again to the first theme then another and so on finally ending at "home."

The picture opens in the kitchen where the mother is making stew. From then on "whenever she (the girl) is home again or talking to somebody from home I used stew colors, a little brown . . . a little orange, a little green, warm comfortable, not rich. Hollywood and New York and the other places she went out to were represented in variations of white," Sylbert says. Although Frances ends up in a mental institution and actually does not go home again, Sylbert compares the last scene (Frances' appearance on "This is Your Life") to one of Mozart's codas. I dressed her friend in white and I dressed her in brown for she is in a sense "home" again."

One of the most important decisions that affects the design of the film, and ultimately the lighting, is whether it will be shot on the sound stage or on location or both. Actually this is a two way decision because some stories like NEW YORK, NEW YORK or WESTSIDE STORY lend themselves better to stylization while other films demand external reality. Many production designers and cinematographers prefer the control of light and other elements when the set is built on the stage. Some designers, like Lawrence Paull would rather adapt existing locations. Nykvist recalled that he had become used to the control of working on constructed sets, "but then the new wave came to Paris with Godard and Louis Malle and all those young directors, and they started to shoot on location. We hated it, I found it so difficult. I couldn't have the collaboration with the production designer, I couldn't put up the things I wanted, I was almost in a panic. But then I found the thing I had been working for for so many years: I found simplicity. I came to realistic lighting. Instead of using 20 lights I now use 2 or 3. I found that that is my style . . . on the set you use too much light and you lose the reality."

In spite of the restrictions of shooting in practical sets (can't punch holes in the ceiling or take out walls) or the vagaries of natural light (sunny one minute, overcast the next), production designers try to provide as many sources of light as possible and work hard to accommodate the lighting equipment. Paull mentioned that for "Dr. Detroit" he had to build four fluted columns in the ballroom of the Biltmore Hotel. They were tied together at the top with steel channel so that the Director of Photography would have something from which to hang his lighting devices.

Paull also brought out the fact that it is important to "get to know how a Director of Photography lights." Some cameramen favor reflected light or bounced light. Others only light from below. Alonzo doesn't use scaffolding because he feels that it often gives the picture a conventional look. In talking about David Walsh, with whom he has done five films, Brenner says, "I know that we have to bring an array of lamps, lighting fixtures, lamp shades and other things for David." Experience is the key to the confidence that builds between the director of photography and the production designer. According to

(TOP) The CANNERY ROW set before it was lighted for camera. (BELOW) The lighted set. Surfaces and walls were made uneven and faceted to reflect light and create an illusion of greater depth. The pavement was formed deliberately to create puddles.

The symbolic use of color in FRANCES helps delineate her rise and fall. (LEFT) Frances' bedroom in her home town, designed in browns. (RIGHT) White becomes Frances' dominant color in Hollywood. Jessica Lange portrays Frances.

Lathrop many production designers have a fine knowledge of the problems of a cameraman in respect to lighting.

The designer needs also to know how well the cinematographer can handle difficult surfaces such as mirrors and other reflective materials. Lathrop declares that "there isn't a set that can be built that cannot be lit." However some cameramen would prefer not to work with shiny surfaces. Lathrop says that "its like trying to photograph gold, it goes black." Nykvist says "I'm not afraid of shiny surfaces. It's like real life . . . but the (actor's) face is the most important and the surface must not detract . . . if it does it should be taken down but sometimes spraying it makes it go dead." According to Alonzo the "tough ones are the new modern sets with very shiny wall-paper . . . looks good to the eye but the camera sometimes picks it up as little mirrors or sometimes as a halation on the wall."

Both MacDonald and Sylbert believe that reflective surfaces are important to give the set an "alive look." Therefore the designer aids the cameraman with ways to overcome the lighting difficulties. Most of the mirrors and many windows are on pivots so that they can be rotated away from the light source. In TURNING POINT Brenner put all the rehearsal hall mirrors on pivots, He points out that "the mirrors (in that scene) reflect a lot of the floor because they are tipped in a certain way." He goes on to say that there is a way of calculating what will be seen through the camera lens because "the basic principle of mirrors is simple, the angle of incidence is equal to the angle of reflection . . . with that little formula you can tell where to put the camera and what you will see reflected . . . the problem is . . . move the camera and all that changes . . . so if you are in a position where you are going to dolly or going to truck or going to move against the mirror its going to change constantly and then you had better provide enough coverage for everything." Boris Leven, when asked about shiny surfaces described how he had designed the lab for ANDROMEDA STRAIN. "It was all stainless steel, walls, floors all over . . . Richard Kline and I discussed it—how to keep that real stainless steel look . . . then he lit it with reflected light . . . he hung a white drop in front of the set and bounced the light in . . . he used auxillary lights for the people."

Black surfaces can be a challenge. Lathrop says "you can pour 10,000 foot candles at a black piano and it is still going to come out black . . . you have to reflect light into it . . . off a white card to get any detail." Lathrop also says that throughout the years he has had trouble with tuxedos absorbing the light. "You can't get any back light sheen." Designers have to be aware of which materials are too absorptive and will go dark on the set, just as they have to be aware of which colors might give trouble. It is interesting to note that some soft materials such as black velvet or felt will absorb light, but a painted black surface is reflective and therefore will never look deep black.

Each cameraman and designer has had varied results with different colors and thus the answers to which colors are the most difficult to use are not consistent; but almost all agree that white is one of the more difficult colors. Lathrop declares that "nothing is worse than a white set with a white gown . . . white around the face is bad because you have to use a scrim on it and when you put light on the face the white flares up." Nykvist is against white walls because "when you color correct for the faces, taking away the red, the walls go blue." And for the same reason he is afraid of blue because it gets bluer. When he needs something to be white he asks the production designer for a cream color and then when it's color corrected it comes out white. MacDonald thinks that green is the hardest color to use: "it is difficult to be exact with it because it has got a wide color span from very light to dark." In reference to green Nykvist recalls FIRST LOVE a picture he made with Maximillian Schell. It was shot in the fields outside Budapest. "It was green everywhere . . . I tried various filters and then I made a special fog filter by using optical glass and spraying it with petroleum oil and that worked fine . . . by being able to spray it I could change its density according to how much green there was."

Film tends to exaggerate color so most designers tend to stay away from bright color, especially in the background. As Lawrence Paull points out, "the set is an environment for action . . . it should compliment the story and work with the action . . . and it must not be overpowering."

When preparing to make CRIES AND WHISPERS with Ingmar Bergman, Nykvist was presented with an extraordinary challenge in respect to color and lighting. Bergman sent the

(ABOVE) Even in a black bathtub, white is the keynote of Frances in Hollywood. (BELOW) Frances' life in a mental institution is depicted in cold grays.

script and production instructions to his colleagues in the form of a letter (New Yorker October 21, 1972). "My Dear Friends," he wrote, "We are going to make a film together . . . The time is the turn of the century . . . The important thing is that the clothes, by their power of suggestion, are in accord with our demand for atmosphere. The same applies to the interiors; when constructing them, we must bear in mind the possibilities of creating the lighting conditions we desire—dawns that look like dusk, soft firelight, the mysterious indirect light on a day when it is snowing . . . at the same time it is important that our decor never be obvious. It should be flexible, enclosing, elusive, and present, evocative without being obtrusive. There is a peculiarity about it, however: all interiors are red of various shades." Bergman had selected this color because he thought of the "inside of the soul as a moist membrane in shades of red." It sounded almost impossible to Nykvist. There were different rooms and "we decided to make them different colors, some of the colors were more dull than others but they were all red . . . people called me and said 'you are crazy Sven, how can you work with red walls . . . the red will get into the faces' . . . I thought about it then I told Ingmar that we should make the scene as far away from the walls as possible and that way I can make a special light on the walls that doesn't hit the actors and then I have another light for the actors and in that way I can separate their faces from the walls . . . I learned a lot from that . . . I found that I could color correct the faces and the walls were still red."

Everyone agrees that lighting for color is much easier than black and white. In black and white, dimension was indicated and separation made on a grey scale from black to white, the shades of grey being dependent on how much light was put on an object in reference to its texture and tone. In color, separation is often accomplished by changing from one color to another. MacDonald states that the "real thing about color is that it is a disintegrator . . . the principal construction quality of color is not construction but difference . . . you can only tell one color from another by its difference . . . its very existence is to relate as difference, one color to another . . . the qualities of dark and light, warm and cool are structural."

Most production designers use color in a structural way as one of the main elements in the overall design concept for a film. As Lawrence Paull says, "sometimes I deliberately design in warm and cool colors; the color palette is always part of the design . . . when you limit the color range it helps give the picture a visual unity. This is what Richard Sylbert did in CHINATOWN and REDS.

The cinematographer is dealing with optical light and therefore it is vital that the production designer be aware of how colors change when they are photographed and how to construct surfaces to give dimension and life to the set. Boris Leven put it very well when he said "sets are designed to be realized with light."

"I build a set very much like sculpture" says MacDonald, "it has to reflect light . . . to have surfaces that turn to the light." Pointing to photographs of the CANNERY ROW sets

he said, "Look, there are no straight surfaces, they are all angled . . . the streets slope up and then down to pick up the light . . . the interior walls are angled so you can see out of the windows . . . of course the camera sees this room as rectangular."

It is not really enough to plan surfaces in relation to lighting, the way the surface is finished is also important. "I hate flat walls," says Paull. "I like textures . . . in AMERICAN GIGOLO Ed Richardson used simple spans and the textures on the wall were the shadows." He went on to say that CHINATOWN was an example of simplicity to a marvelous degree. Richard Sylbert says, "A surface should never be boring . . . there is no such thing to me as a flat wall . . . there is life in every inch of wall . . . not only is there the basic color but what I do is a lot of glazing . . . because that is how you get optical color, transparent overglazes." Richard MacDonald does it by painting the wall twice. First he paints it with a warm version of the basic color and then he spatter paints all over that with a cool version of the same color. This gives the surface a vibration between warm and cool. As he says, "you can really trick the camera . . . the surface is not dead. When it goes into a cool or warm light different parts of it come up." MacDonald says that a designer has to consider even simple surfaces like plastered walls. "You should get a good plasterer who will give life to the wall so that the light falling on it has shadows and it is not dead."

The process of glazing or spattering over the basic color is called aging. Sylbert does all the aging on his sets himself. According to Brenner, raw umber used to be used to age the sets but it had a tendency to turn green under certain circumstances. Brenner now uses transparent Japan colors.

This technique of manipulating optical color by overglazing turned out to be the best solution to the problem that occurred during the filming of TURNING POINT. In the rehearsal hall scene where Mikhail Baryshnikov and Leslie Browne are dancing the pas de deux "Herb Ross said I want the set to change to fantasy, romantic . . . o.k. I said that's easy we will just repaint it . . . 'No,' comes back from the production manager, 'we only have two hours'. . . so I had to come up with a solution." The wall was painted pink and then washed over with transparent white. Colored gels were used on the lights and that pulled out the undertones, the room turned slowly to a glowing warm pink while they were dancing.

In the last analysis the cameraman's basic tool is light and the production designer's basic concern is to create surfaces, textures and colors that will react well to light. Moreover, the cameraman needs from the production designer sources for light and opportunities for shadows. Richard Sylbert summed it up when he said "Every window in REDS is there for him (the cameraman) that's my present to him." ■

Jae Carmichael is an adjunct professor in the Cinema Department at U.S.C. teaching a course in design for film.

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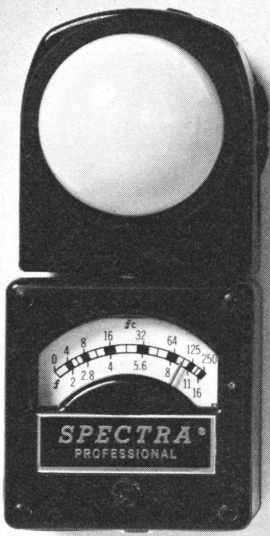

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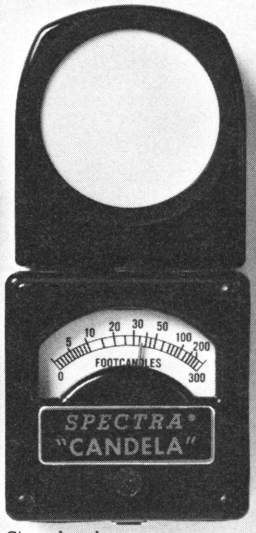

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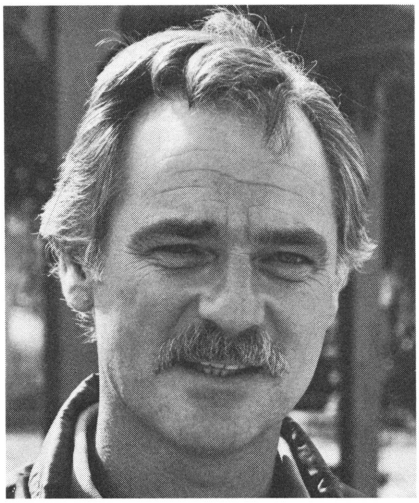
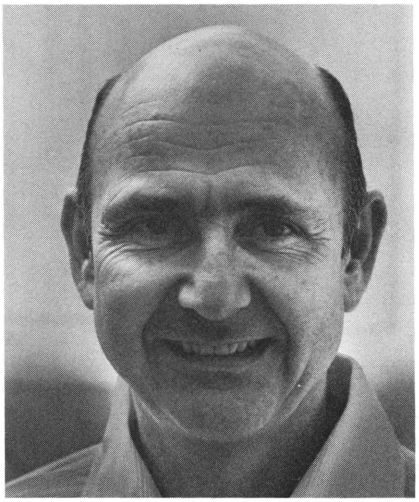
Two veteran camera men talk about cameras:

Bob Marta became a First Assistant in 1966 and an Operator in 1979. He is currently the President of The Society Of Operating Cameramen.

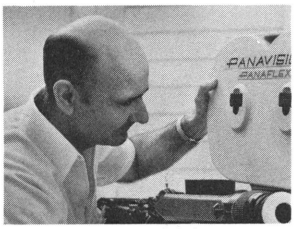
Dick Barth is probably the most experienced First Assistant Cameraman alive. He has been a First Assistant in Hollywood since 1957.



Bob Marta



Dick Barth



The Operator and First Assistant are the people who directly work with the camera. They know the machinery and what's available.

"Until 1959, I was with Republic; then I moved to Universal," says Dick Barth. "The studios all had camera departments in those days. So I'm used to getting cameras from a source."

"Since 1964, I've spent my life in rental houses, here and abroad. I've worked with cameras from almost all the rental sources in the U.S.A. Not one of them has the quality control that Panavision has."

"Panavision has more of everything — but size is not the issue. Mark Armistead used to be very small, but they had excellent quality control, even then. It's the people at Panavision."

"Rental prices aren't the whole story. What you don't see on paper is the time and money you save on the set with the Panaflex — because everything is compatible and you have all the accessories you'll need."

Dick Barth

Saving time and money

"And with Panavision, there's a system. Rental prices aren't the whole story," says Mr. Barth. "What you don't see on paper is the time and money you save on the set with the Panaflex—

because everything is compatible and you have all the accessories you'll need."

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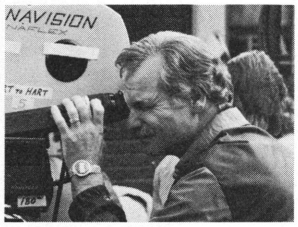
"The new Brand X wild camera you can't hand-hold. In theory, there's an offset finder for it — but try to get one! The Brand X sync camera works 95% of the time. But when it *does* break, there's a problem with spares."

Bob Marta

"And to see, you had to push your eye in further and center it. With the Golden Panaflex, you can roll your eye around anywhere you want without losing the image. And with the long finder, it's **much** brighter."

Give me a box . . .

"My father was a cameraman for 53 years. He used to say: "Give me a box with a lens and I'll give you a picture." He first used a Panaflex on **The Trial Of Billy Jack.** After that, he wouldn't use any other camera."



"You wouldn't expect actors to distinguish one camera from another," says Bob Marta, "But they can. The camera they like is the one they haven't seen the crew fussing over."

Robert Wagner

"On **Hart To Hart,** which I'm shooting now, we were told we couldn't have Panavision equipment. Robert Wagner said: "We want the Rolls-Royce of TV series — we're going to have the Rolls-Royce of cameras." So we're using a Panaflex."

New one in 25 minutes

"I wouldn't want to own a camera. If anything goes wrong with the one on this set, Panavision will have a new one here in 25 minutes. Not that it's going to happen. I've been using Panaflexes almost every day for the past ten years. Only once has there been a problem. That was moisture in the electronics."

Custom parts

"For three years, I rented Panaflex serial number 11. I told them: "Don't change it," so they didn't. Then one day I saw the great updates they'd built into all the others . . . And they'll build a custom part for you while you wait, or deliver it next morning."

Problems

"On another TV show in 1981, we used one of the other makes of camera," says Mr. Marta. "Problems with the magazines and with the zoom lens gearing . . . The follow-focus was so stiff, the assistant changing focus was panning the camera! He couldn't help it."

"Since 1964, I've spent my *life* in rental houses, here and abroad. I've worked with cameras from almost all the rental sources in the U.S.A. Not *one* of them has the quality control Panavision has."

Dick Barth

Panavision Inc. 18618 Oxnard
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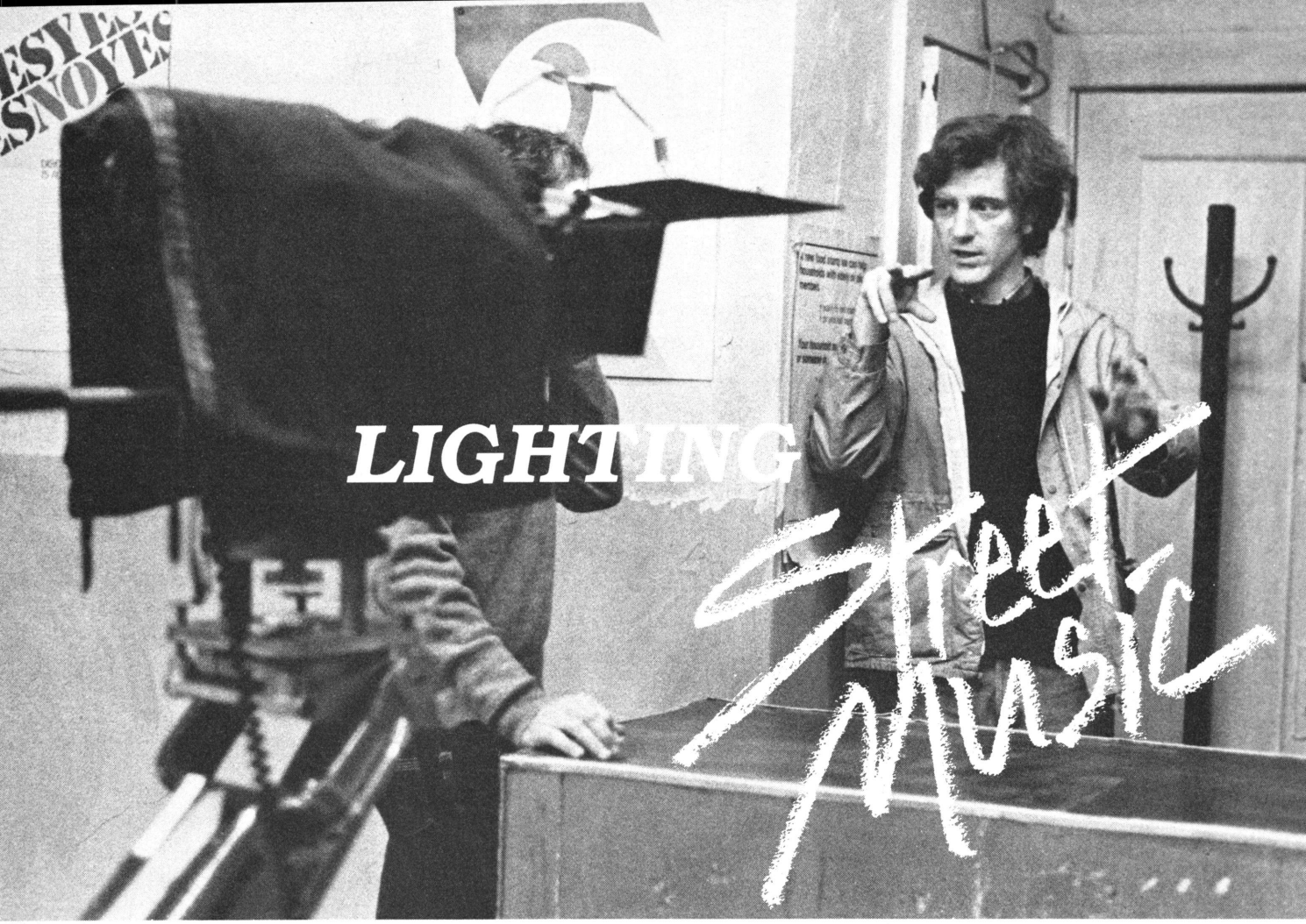


LIGHTING Street Music

Director of photography Dick Bowen sets a shot in cramped quarters at the Victory Hotel in San Francisco.

by DICK BOWEN

The cinematographer who doesn't have to concern himself with the economics of filmmaking is a rare creature—if he exists at all. Schedules and budgets. Time and money. There's never enough.

The process, then, of lighting a film nearly always resembles a balancing act. Juggling the look you've imagined with the resources available is no mean trick; that balancing act constitutes much of the craft of cinematography. Of course, techniques and challenges vary greatly with the size of each production. And for the D.P. on a low-budget feature, juggling can become an obsession.

Statistics show that last year the average film cost $11,000,000. For every $20–30,000,000 studio blockbuster, there was a $250,000–$1,500,000 independent feature to lower the average. And STREET MUSIC was one. Independently produced, shot entirely on location in San Francisco in 35mm with an Arri BL II, using Kodak 5247, STREET MUSIC's total budget was $600,000 . . . about 6% of the cost of the average film. My personal goal, as the D.P. on STREET MUSIC, was to realize the movie I imagined: I didn't want to ever use lack of money as an excuse for a "low-budget" look.

The movie, in brief, tells the story of Sadie Delaware, who sings and tapdances on the streets of San Francisco for tourist coins, and Eddie Beagle, her live-in boyfriend, who drives a tour bus. Their home is the Victory Hotel, a dilapidated, but colorful place on the seedy side of town. When the landlord decides to demolish the hotel, the elderly tenants decide to fight back. Their struggle provides the backdrop for exploring the relationship between Sadie and Eddie.

Certainly a potential pitfall in a film like STREET MUSIC—dealing as it does, with old folks, poverty and eviction—is the tendency to become maudlin or depressing. Jenny Bowen, who wrote and directed the movie (and is my wife) felt strongly that with dialogue, casting, music, art direction, cutting, and certainly lighting and composition, we must work against that grim threat. This was not to be a gritty documentary, but a friendly, funny, upbeat look at some little people who were struggling to do something big. The visual style would be slick enough to ennoble the story and characters, and down-to-earth enough to preserve realism (eg. well-modeled portraits, wrinkles intact.) We were after a precise look; to achieve it would require precise control. In lighting, precise control usually translates into plenty of equipment and lots of time. We had precious little of either.

The challenge, then, became to find or create at minimal cost, environments where shooting could proceed virtually uninterrupted by lighting adjustments. On exteriors, the trick is to

work within areas that already have the appropriate natural light—open shade, backlight, and so on. With a flexible attitude and the right exposure, it's pretty easy to shoot effective footage outdoors without lighting equipment or set-up time.

Interior lighting is another story. It is accepted practice that control comes through individually lighting each angle. While it's common to "rough in" a set, lots of time is always spent between set-ups—and especially on reverses—resetting a myriad of lights, flags, cables, and assorted other devices to maximize the potential, but I knew going in that I had to average over 16 different set-ups each day. My only hope was to convert the entire Victory Hotel (our primary location) into a ready-to-shoot stage before the actors ever got to the set. We needed to do much more than pre-rig the first angle to be shot in a given room; we needed to rig each room so that with no visible movie equipment, it was 90% lit for any angle. We needed to create our own "natural" light.

MILDRED'S ROOM

Mildred is a lovely dingy old character, the grande dame of the hotel. Some of the happiest and saddest moments in the film take place in her room—nearly all at night. The set was 10 x 15 feet with an 8 foot high ceiling and two 6 x 7 foot windows with broad second-story views of the buildings across the street. There were several party scenes in this small room, some requiring up to 15 elderly actors and ten nervous cats. In this cramped situation, it was essential to keep the room as cool and uncluttered as we could manage.

The windows were the first obstacle. Night shooting was out of the question. No budget. Simply blacking out the windows would have made the already tiny room downright claustrophobic. I decided to splurge about $700 on two backings that would not only provide some much-needed depth while converting the room to 24-hour night time, but also would insulate us from the street noise below.

Using a 5 x 7 view camera, we shot black-and-white negatives of the views out of each window. We randomly placed 250 watt and 500 watt photofloods in the windows across the street, and the facade was lit with two 2K's on full flood from the sidewalk below. By shooting at very late dusk with long, bracketed exposures at F64, we got the right balance between facade detail and the highlights in the windows. We then made 6 x 7 foot enlargements of each view onto acetate, had them hand-tinted to add color, and stretched onto wooden frames that fit snugly into the windows. Each transparency was backlit with three 4-foot long Deluxe cool white fluorescent tubes, which have a bluish tinge that would contrast nicely with the warmth I intended inside the room. We adjusted the intensity of the fluorescents by applying 1-inch black paper tape directly to the tube behind the thinnest areas of the transparency so that we got an evenly balanced F1.4 reflected reading. We mounted a ⅜" sheet of plywood behind the entire contraption and turned our attention to the room itself.

With a low ceiling and limited space, most conventional lighting units were either impossible to rig out of view or too powerful for our needs. I decided to use fluorescents, the most maligned light in the world. Fluorescents are usually associated with a flat, greenish, unflattering look because they are most often encountered in broad overhead banks of cool white bulbs. Far from putting out a flat light, a single fluorescent tube (or tight cluster of tubes) can be as directional and soft as a conventional unit bounced or aimed through multiple layers of diffusion, accomplishing its effect more simply in a much smaller area. Because of the shape (or "aperture") of the tube, it can be positioned to wrap the subject with a pleasant modeling effect and rarely needs fill light.

Using 3200° fluorescents manufactured by the Duro-Test Corporation, we built two light boxes, each holding four 2-foot tubes surrounded by an adjustable duvatin skirt, then mounted the boxes flush with the ceiling, centered about ten feet apart. The fall-off characteristics of fluore

Backings made by enlarging 5 x 7 black-and-white negatives onto acetate, hand tinting them and mounting them on wooden frames were placed outside the hotel windows to permit interior day for night shooting.

Mr. Potts' TV is actually a fluorescent lighting unit rigged inside an old set to create the lighting effect caused by the screen.

Mildred's room was lit with overhead light boxes containing 3200° fluorescent bulbs. The backing is visible through the window and is casting a slight blue light onto the curtain.

scents rigged in such a manner were perfect for a room of this size. Directly under each unit we got a soft but directional top light of about 40 foot-candles which required no fill. About five feet away, near the walls, all directionality had dissipated, but we still had an even 4–8 foot-candles of "coming-from-nowhere" fill light that penetrated every corner of the room with a basic illumination.

We placed an assortment of small key lights—practical lamps rigged with PH 211 or PH 212 enlarger bulbs—around the edges of the room. Each had its own 200 watt hand dimmer (the little high-tech kind they sell at hardware stores for about $8 each) allowing the lamp to be individually adjusted for the density and shape of its shade. Generally, if the lamp was in the background of the shot, we'd cheat it close to the wall and crank it up to provide a convincing effect and a point of composition. If the lamp was near the subject, it would function as the key light. To enhance modeling, we'd usually sneak in a heavily diffused inky, adjusting its color temperature by eye on a separate dimmer.

Beyond cheating the practicals and bringing in any inky or two from time to time, we made few adjustments during shooting. The mood of the lighting could be changed radically simply by altering the number and intensity of the practicals on at any time. With all units running at full blast (1500 watts maximum, all powered

by household extension cords), the big party scenes were bright and gay. In more somber moments, Mildred sat alone under the fluorescent pool in the center of the room, dark except for one dim lamp on her dresser near the opposite wall. The lighting transition from one mood to the other took minutes. On this set we averaged over 20 setups each day.

HOTEL CORRIDORS

In contrast to the warmth of the living areas, we wanted the corridors to have an impersonal and forlorn feeling, like bare bulbs strung overhead. Since most of the action consisted simply of actors traveling between rooms, it was decided to use these hallways as a sort of "cover set." The idea was that whenever we had an actor free, or were waiting on a slowdown, we'd run upstairs, throw a switch, and shoot. Whatever lighting scheme I chose had to remain in place for the entire shoot. And because most of the coverage planned consisted of long, handheld tracking shots, I would need a great many units.

Even on the smallest productions, the consumption of coffee is staggering. I asked that the coffee supply be purchased well in advance, emptied all of it into plastic bags, and had the corridor lighting units fashioned out of coffee cans. Ventilation holes were cut in each top with a can opener, ceramic fixtures were rigged inside, a PH 211 was screwed into each, and we were in business. With several of the cans wired together in series, hanging at even lengths, their metalized insides providing hard light pools, the corridors soon had the look I wanted. Occasionally, we'd hang a second bare bulb below the level of the coffee can light, allowing this supposed source to be visible in the shot.

There were two enclosed lightwells outside the only windows in the corridors. Because we were the second story of a six-story building, the light was very blue and dim outside. By applying 85 N3 to the windows we achieved a realistic night look outside, all day long.

MR. POTTS' ROOM

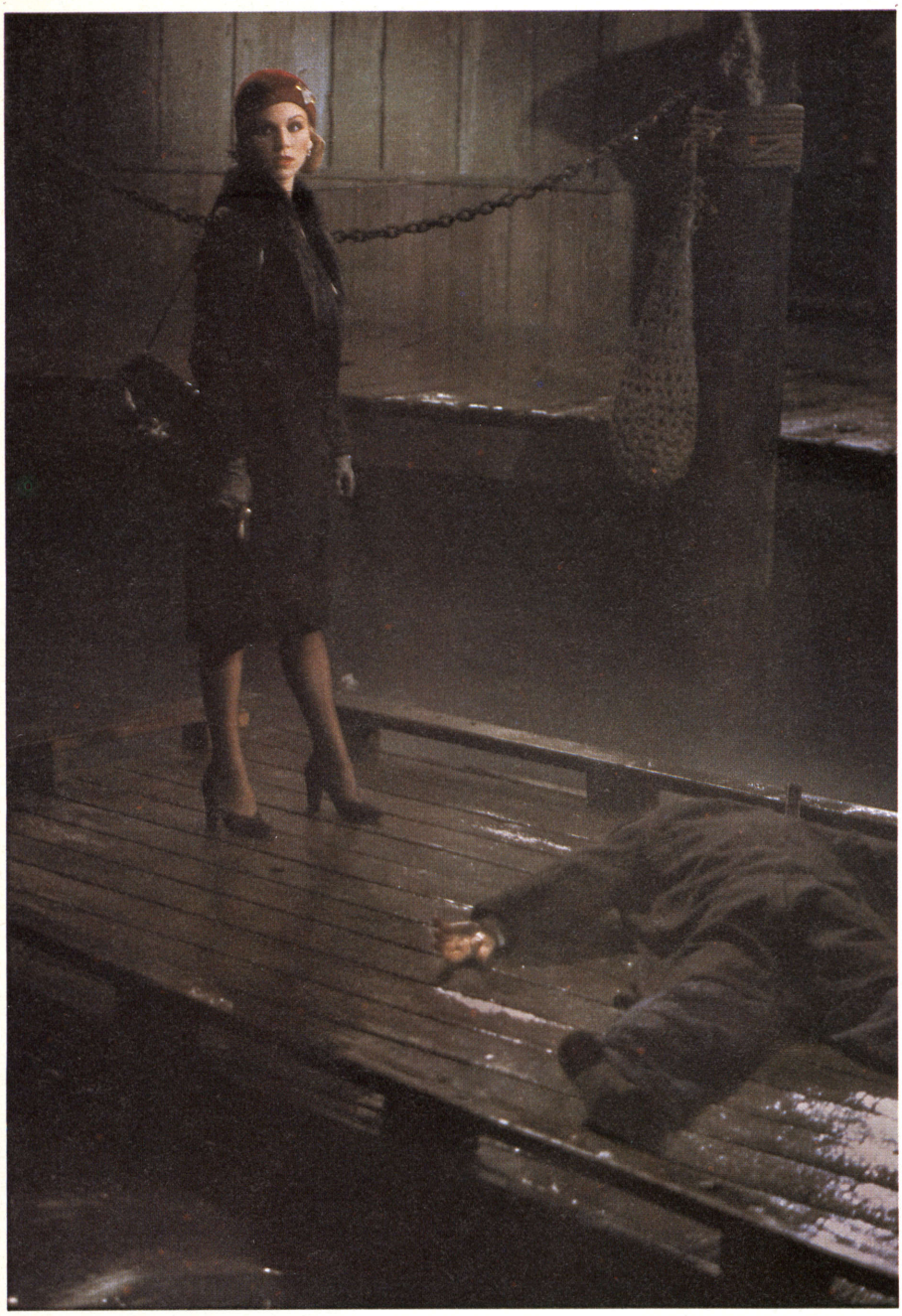
My favorite homemade contraption was used to light the room of Mr. Potts, who sits all day long, mute and uncomprehending in front of his old black-and-white TV. It was essential that the only light in Mr. Potts' life be his television. Like a child, he sits so close to the TV that we couldn't realistically cheat the light from another source. When you observe a dark room with a TV on, you notice that the light is always moving and flickering and reaches into every corner of the room. A real television doesn't put out enough incident light to work with, so I decided to convert Potts' TV into a workable key light. We bought an old junk TV, identical to the working model the prop department had already acquired for Potts. After breaking out the picture tube, we mounted four 18-inch fluorescent tubes inside, each wired to its own on-off switch. Two of the tubes were 3200 degrees and two were Deluxe cool whites: a mixture providing the proper purplish grey light of the television. When Mr. Potts sat in front of his fake television and the tubes were randomly turned on and off, the effect was perfect. It came from one source, gave Potts a believable modeling with the right movement to the light, and the entire room was filled with the same effect—and, we were able to shoot uninterrupted.

I explored dozens of other low-budget lighting techniques while shooting STREET MUSIC, but in my experience, the message was always the same. Cinematography is storytelling with moving images; the visual texture of those images needn't be sacrificed for lack of money. What the "low-budget" cinematographer must be willing to do, in order to avoid settling for a "low-budget" look to his picture, is to involve himself in the economics of the whole filmmaking process. Rather than simply ordering fewer lights and working faster, the challenge is to design non-traditional systems that allow him to achieve his visual objectives. And that, finally is its own reward. ■

The corridors were lit with "coffee can lights" to produce an appropriate harshness and to permit long handheld tracking shots. The window onto the lightwell is covered with 85 N3 to create a night effect.

CLASSIC LIGHTING FOR HAMMETT

by RICHARD PATTERSON



Photos by MORGAN RENARD © Zoetrope Studios

''Actually the way I photograph is the way they photographed 40, 50, 60, 80 years ago. It's just basic lighting and basic photography.'' Joe Biroc, ASC is talking about his work on HAMMETT, a very stylish detective movie involving a character loosely based on Dashiell Hammett, the creator of Sam Spade and ''The Maltese Falcon.'' Hammett, who is credited with having gotten murder out of the vicar's rose garden and back to the people who are really good at it, was himself a private detective before he became a writer. The story for the movie has his former partner enlisting his help on a missing persons case which rapidly develops into a web of blackmail and murder. The film was produced by Fred Roos, Ronald Colby and Don Guest for Zoetrope Studios and was directed by Wim Wenders, a German director whose previous credits include AN AMERICAN FRIEND. Wenders is a great admirer of *film noir* and the classics of the Thirties and Forties. To shoot HAMMETT he wanted a cameraman who had been schooled in the traditions of Hollywood and who liked to work with high contrast. Ultimately he used two cameramen, Biroc and Phil Lathrop, ASC; and he got what Biroc describes as a color film shot like a black and white film.

The evolution of HAMMETT from the novel by Joe Gores to the movie which is finally being released this month more than two years after it began photography was a long and

Marilu Henner as Sue Alabama, a character in one of Hammett's stories which is visualized at the beginning of the film. This scene was lit by Phil Lathrop on the stage at Zoetrope Studios.

sometimes torturous process which could fill a book. For our purposes here it is sufficient to know that Lathrop originally shot a week's worth of tests for the picture and then Biroc was engaged for the production. After ten or twelve weeks of photography the production was shut down for script revisions. When it started up again finally, Lathrop was brought in and approximately 85% of the script was reshot in 20 days on the stages at Zoetrope. At least one principal role had been recast and the leading lady's look had been totally changed.

It is impossible for the viewer to tell which scenes in the film were shot by Biroc and which by Lathrop. There are, however, significant differences in the way they work and even subtle differences in style which become apparent in their descriptions of the lighting setups they used. In order to appreciate these differences, it may be best to begin by seeing both cinematographers in the larger context of the tradition which they represent.

What exactly is traditional Hollywood lighting? There are different schools or approaches to lighting

(ABOVE) A street scene staged on a set at Zoetrope. All of the night exteriors Lathrop photographed for HAMMETT were shot in the studio. (BELOW) The waterfront set at Zoetrope was one of the many sets crammed onto the stage at Zoetrope. According to Lathrop, one of the reasons he lit to a 50fc key and pushed the film was the necessity of lighting this set from as far as 100 feet away.

Fong's casino was shot in an old firehouse in Los Angeles which had a 22 foot ceiling on the first floor. Biroc was able to light the set just as he would on a stage using 8 or 10 10K's for key lights and probably over 30 lighting units altogether plus photoflood bulbs in the practical fixtures. The camera panned over to follow Hammett up the stairs on the left side of the set and 10K's were used to cast hard shadows on the wall next to the stairs.

within the mainstream of the Hollywood tradition, but they all share a preference for hard light and a tendency to employ portrait lighting techniques. To a large extent this is what Biroc means by "basic lighting and basic photography." Hard light, generally from a lighting unit with a fresnel lens, is used because it brings out the modeling and texture of objects with its distinct shadows. It also produces "cleaner" edges in the image and gives the image "snap" or an increased apparent sharpness. Its hard shadows can be used to create a mood—especially in the case of a mystery film. In the early days when silent films were often shot on open air stages, many films were shot with natural light or with sunlight diffused by fabric hung over the stage. The result was often a soft light comparable to light in an artist's studio with a northern exposure or to the kind of lighting that has become popular in more recent years. Soft light produces a much less defined edge to shadows and may seem more subtle or less dramatic depending on the subject matter or your point of view. Once film production moved into the studio with artificial light, hard light became the norm for most setups—especially once the star system became established and lighting techniques were used to glamorize the stars.

There are three or four basic approaches to portrait photography which have been adapted for use in motion picture lighting. They are all based on the use of shadows to emphasize or enhance the facial structure of the subject and they involve a principal or "key" light at an angle to the axis of the camera supplemented by "fill" light and "back" light. The most basic portrait lighting setup uses a key light at a 45° angle to the camera axis and slightly higher than the camera. This is sometimes referred to as a ¾ front key. A softer fill light of less intensity coming more or less from the direction of the camera on the other side may be used to provide some illumination of the shadow areas, and a back light aimed almost directly at the camera from behind the subject is used to provide a rim of light around the subject which separates the subject from the background. A separate light may be used to illuminate the background and a very small light at camera level may be used as an "eye light" to provide a

The climatic confrontation between Hammett and Crystal Ling (Lydia Lei) looks different from the prologue sequence primarily because of the fog. Lathrop tried to get as many practical lights into the scene as possible to enhance the effect of the fog. He had yellow light coming out of windows in the background and a variety of street lamps as well as the car headlights.

(LEFT) Another street set constructed on the stage at Zoetrope. Hammett (Forrest) and Kit Conger (Marilu Henner) get out of the cab driven by Eli (Elisha Cook) and walk over to the newsstand where Hammett questions Frank (Fox Harris) about a ticket for a numbers racket. (ABOVE) One of the location exteriors in San Francisco with Alcatraz island barely visible in the background. Biroc was plagued by intermittent rain and bright sunshine while shooting in San Francisco.

Lathrop lit this closeup of Alabama Sue in the car with Ryan using one key for both of them, (probably a junior). He then added a glow on the window to define the edge of her head, a little soft light coming through the rear window of the car to round her out, and the light for the effect and in the background.

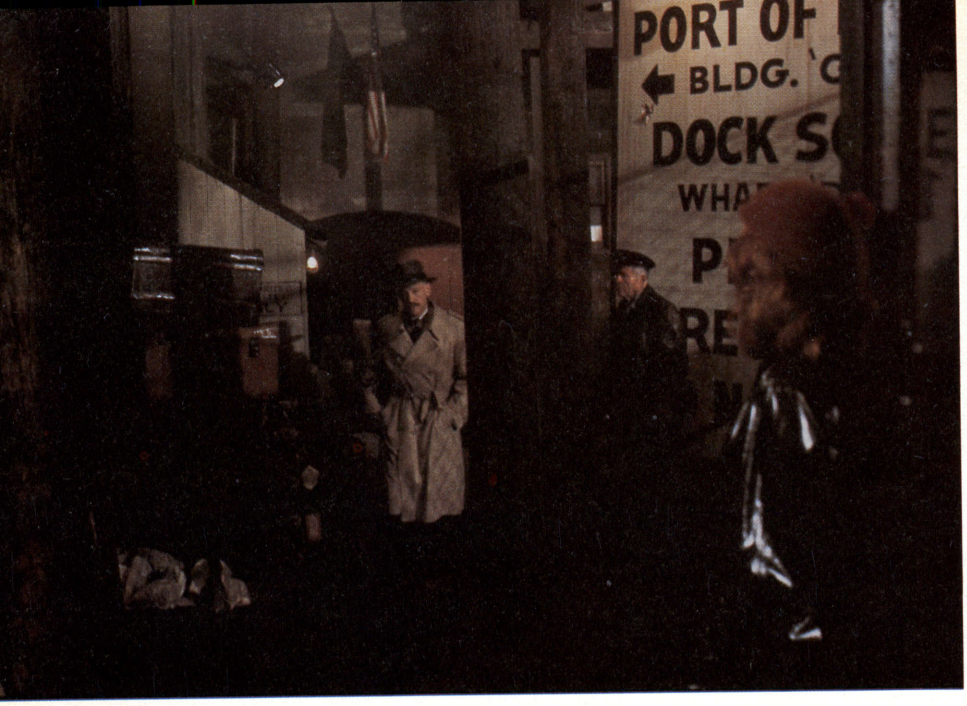
Lathrop lit Crystal Ling (Lydia Lei) to half key for this low key day scene and he added fill from a 500 watt half broad with 2 or 3 silks on it.

Note: There is a limit to which it is possible to represent a cinematographer's lighting setups with publicity stills for a picture. Often the still cameraman may not expose for the same effect and his angle is invariably different from that of the motion picture camera. As a result the relationship between elements in the scene, particularly the position of a break on a wall behind an actor, will be different in the stills.

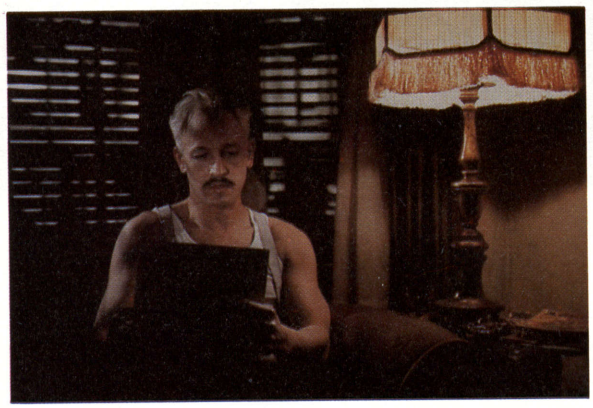
Lathrop lit O'Mara's interrogation of Hammett purely with the practical lamp which casts its light in a variety of directions during the scene. There is a bare red bulb on the wall behind Hammett which is simply part of the set and Lathrop added some light on the wall behind the bars.

Biroc lit Fong's office with four key lights. Hammett and Fong's guard (James Quinn) in the background are lit from the left with separate keys. The key light on the guard in the background is about half as bright as Hammett's key. Fong (Michael Chow) and the girl who comes in to serve tea are lit with separate key lights from the right. The office was a location and the key lights were probably juniors on spreaders. There were additional lights for the cabinet, the tapestry behind the girl and the top of Fong's desk. The lamp on the desk had a photoflood on a dimmer, but the bulbs in the wall fixtures were dulled with black or brown hair spray.

(ABOVE) Hammett's meeting with the men in the boardroom was shot with a 360° pan from a low angle revealing all eight walls of the room as Hammett circled around the men. Lathrop tried every conceivable way to light the room and rejected overhead soft light in favor of eight juniors mounted just above the edge of the frame. (LEFT) The shot of Hagedorn with the new paper was one of a series of vignettes shot throughout the production for use in a montage at the end of the film. The vignettes were converted to black and white images and superimposed over a color shot of Hammett as his mind transforms his real adventure into the makings of a detective story.



This closeup of Hammett (Forrest) with his manuscript is a complement to a wider scene photographed by Lathrop. He is backlit by a street light effect coming through the window hitting the side of his nose and his back. The remainder of the light on his face is coming from a photoflood bulb in the lamp on the table beside him plus a little eyelight from the camera angle. There may have also been a light on the wall to create the effect of the table lamp.



Hammett at his desk in the early morning is keyed by Biroc from the left up high as can be seen by the shadows on his face. The same light is creating the break on the drapes in back and also defining the front edge of the desk. It is flagged off the lamp on the desk and the top part of the drapes. The crates in the foreground are lit from the same direction as the key light but with a gold filter on the light to simulate early morning light and a venetian blind shadow. The rug is toplit and helps silhouette the foreground objects. There is a separate small unit on the bookcase, but there is no overall fill light at all. There is no light coming through the window behind Hammett or in the kitchen since it would complicate seeing the set behind the window. There is another small light on the bookcase by the door to the kitchen and a light lining the edge of the door. The kitchen has a light hitting the table top and the window.

Perhaps the most complex setup Lathrop lit was for the shot in which Hammett rejoins Kit after his confrontation with Crystal Ling. The camera pulls back from the angle on Kit and Eli waiting to get a full shot of Hammett as he delivers the negatives to Lt. O'Mara (R.G. Armstrong). Originally Wenders wanted to continue the shot through the point where Kit, Eli and Hammett get into the cab, but it proved impossible to shoot without seeing the dolly tracks. Lathrop began by lighting the places where he wanted to see Hammett as he walked towards Kit. He is silhouetted as he comes out of the passageway and he walks in and out of patches of cross light. Lathrop did not let him ever go completely dark, but let him go through different light levels. The ¾ back light on Kit in the foreground was established in an earlier angle. When Hammett reaches Kit he is lit by the same key that he walks into as he approaches O'Mara plus a liner coming from the opposite direction onto his back and cheek. The street in the background of the second angle was pre-lit so that Lathrop could simply switch on the units he wanted to use for this setup. The remaining background lights were set after the key lights and there were probably about 15 units in all. The same lighting was simply cleaned up a bit for the continuation of the scene in the next cut as they get into the cab.

By using ¾ back key lights on Hammett and Hagedorn (Roy Kinnear) Lathrop was able to create substantial shadow areas while at the same time creating the effect of a fully lit room. The use of the black Chinese screen behind the bed is an example of the way art direction can add to the natural shadow areas in the image. Hagedorn's key also lit the area next to Hammett where the fight breaks out. Hammett's key is flagged off the bed and another top light creates the effect of the hanging lamps on the bed. There is a unit lighting the area around the door in the background and a light to create the effect of the lamp on top of the dresser.

Phil Lathrop looks the part as he lights the waterfront set for the final sequence of HAMMETT

sparkle or highlight in the eyes. This has long been considered the most flattering way to light a face and is generally regarded as basic. As Lathrop puts it, "When you're shooting a woman there's only one way you can light her well and that's the way you light her. You can do it with two or three lights. It's very simple to light a woman's closeups if you know where to put the lights. I could light a closeup of any woman in ten minutes. When I was an operator and an assistant cameraman, I sometimes saw a cameraman take two hours to light a closeup. A lot of it was baloney in those days. I mean, what can you do in two hours? There's basic lighting: a key light, a backlight in the right place or maybe two backlights according to what the hair is like, an eye light and a certain amount of fill. Period. You can't do anything more. That's all you can do to a face. You can put a little glow around her cheek, but then probably something happens—it hits her nose or something."

The traditional cameraman will take more liberties in lighting a man than in lighting a woman. The direction of the key may be shifted to provide cross light coming at a 90° angle to the camera axis or ¾ back light sometimes referred to as Rembrandt lighting. Here is one place where Biroc and Lathrop differ. Biroc almost always keeps his key light towards the front of the subject so that the key can strike the actor's eyes. Lathrop agrees with Biroc about the importance of being able to see the actor's eyes, but he will use a ¾ back key and add an eyelight just for the eyes. Much of what Biroc did on HAMMETT involved cross light or "half light" with the key coming from just a little bit front of directly to the side, but he would seldom use a ¾ back cross light for his key unless the actor turned into the light so that it struck his face more directly. A great deal of Lathrop's lighting on the other hand involved a ¾ back key light.

Traditionally Hollywood cameramen prefer to maintain a fairly high ratio between the intensity of the key light and the fill light. The ratio may depend on the subject matter—comedy is generally thought to demand flatter lighting than drama—but it will also depend on the personal style of the cameraman. Lathrop and Biroc both like to work with very high contrast. In fact Biroc prefers not to use any fill light at all, or as he puts it in more colorful jargon, "I never carry a broad." This is obviously why they were shooting HAMMETT. Lathrop's reputation was established in the earlier years of his career by the high contrast work he did shooting "Peter Gunn" in black-and-white for television, and he insists that he lit HAMMETT in exactly the same way as he did "Peter Gunn." When Wim Wenders asked Biroc if he could see some of his work during their preliminary discussions, Biroc's first suggestion was HUSH, HUSH SWEET CHARLOTTE, a black and white film for which he received an Academy Award nomination in 1965. When asked if he would have lit HAMMETT any differently for black-and-white film, Biroc insists that he would have done exactly the same thing. Lathrop says that his approach would have been the same, but it would have taken more time to adjust light levels on the background to provide separation. With color film, he could count on the colors in the scene to help with the separation.

Both Lathrop and Biroc are adamant about not using fill light on a picture like HAMMETT. Lathrop comments that the main difference between his work on HAMMETT and the way another Hollywood cameraman might have shot the picture would probably be in the use of fill light, although he imagines there are several other cameramen who would have done more or less what he did. When Lathrop talks about not using fill light, he is referring primarily to the night scenes, although he says he shot all of THE DRIVER with absolutely no fill light. For a day interior in HAMMETT such as the scene when Hammett finds Crystal Ling (Lydia Lei) in his apartment, Lathrop would use a certain amount of fill light even though the net result was still a very low key image filled with deep shadow areas. Biroc on the other hand would not even use fill on a day interior.

There are two schools of thought within the Hollywood tradition which affect the way in which portrait lighting is adapted for use in motion picture work. These schools can be called Pictorialism and Naturalism, and they are admirably represented by Biroc and Lathrop. The key ingredient in Naturalism is "source lighting" in which the direction of the key light is determined by the apparent source of light within the scene or by a source which can be logically inferred from what is seen within the shot. Most contemporary cameramen will set the key light in a wider shot to correspond to a naturalistic source, although they may cheat the direction of the key in a closeup in order to provide more flattering or interesting light on the actor. Lathrop's descrip-

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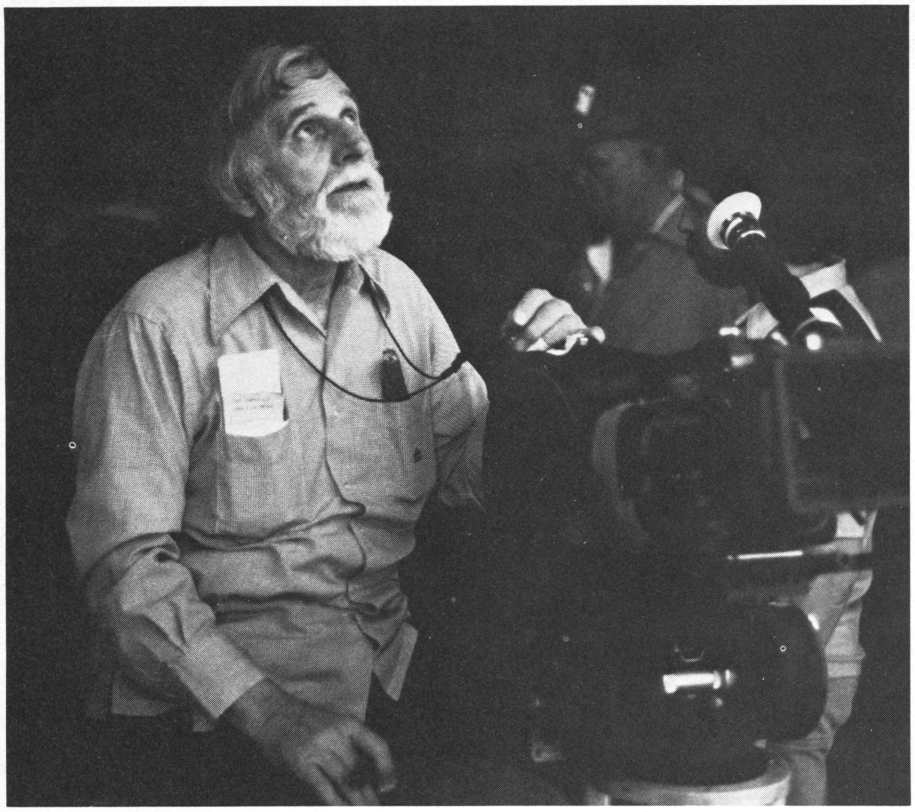

Joe Biroc checks a lighting setup on the stage at Zoetrope studios during the initial production period for HAMMETT

tions of his lighting for HAMMETT included references to the apparent source for his key light. Biroc, however, is of the old school of Pictorialists who do not feel that the key light need be determined by anything other than what makes the best looking image. He insists that he is not the least bit concerned about the apparent source of his key light. "A person can be standing right by a window that is lit for sunlight coming through it; and, if it doesn't look good to me to light him from the direction of the sunlight, I'll light him the opposite way. When I was an operator many years ago, I worked with a sensational cameraman named Henry Gerrard. One time he was photographing a scene with a man standing up and a woman sitting down right along side of him. The woman was lit front cross from one side and the man was lit front cross from the other side with a little back light, and I said to him, 'Henry, why are the people lit from two different ways?' He was a kind of droll guy, and he took his viewing glass up to his eye and looked at it and said, 'It looks pretty good doesn't it?' I said, 'Yeah, looks damn good:' and he turned to me and said, 'Make every scene that you photograph as good as you can—no matter where the light comes from.' I've talked with many cameramen who worked with him as an operator or an assistant, and they all say the same thing. Source light is a pile of . . . well, a matter of opinion. You like rock music; I like light opera. It's strictly a matter of opinion."

Biroc feels that only a photographer analyzing a scene will be able to tell that a person's key light is not coming from the direction of a natural source of light implied by the setting and that a striking photographic image will do more to engage the viewer's eye than an adherence to a naturalistic logic. There are of course two venerable traditions in Hollywood embodying this pictorialist approach: the glamorizing of the stars and the expressionistic imagery of horror films and mysteries. During the last twenty years or so there has been a trend away from this kind of pictorialism towards a more realistic image. Many cameramen would say that even if the viewer does not know that a key light is coming from the "wrong" direction, the net effect of the image is a sense of artificiality especially when the lighting tends to glamorize the actor or actress. If the subject matter of the film purports to be realistic, then the artificiality of the lighting can work against the impact of the picture. Although Lathrop says that his initial discussions with Wenders involved the concept of source lighting, it may not have been as critical a consideration since the audience for HAMMETT probably does not expect a completely realistic story or image. HAMMETT is like a resurrection of the movies of the Thirties and part of the pleasure in viewing it may be a sense of how much it resembles classic films in the *genre.* Moreover a great deal of the lighting in HAMMETT is source lighting and even Biroc's lighting is not necessarily inconsistent with a logical source implied by a scene. The point is simply that Biroc does not hesitate to light a scene without consideration of the apparent source.

A distinction should perhaps be made between pictorialism of the sort represented by Biroc's work and another approach to lighting which does not take the apparent source into consideration. In many situations cameramen are forced simply to light a scene to get an image on film quickly and can not take the time to design the lighting according to a theoretical source. Their primary concern is to light the scene so that everything can be seen clearly and there are no distracting shadows. Usually they will employ relatively flat, soft light and the net result obviously bears no resemblance to the scenes photographed by Biroc. One of the most striking things one discovers in talking with cameramen like Biroc or Lathrop, however, is that traditional lighting is not necessarily all that time consuming to set up. It requires experience on the part of the cameraman and a crew that understands what he is trying to do, but it does not always take 30 lighting units and two hours to light a shot. The fact that Lathrop shot 85 minutes of screen time for HAMMETT in 20 days (or the equivalent of 24 days considering the overtime) is an indication of what an experienced cameraman can do.

Lathrop describes the essence of his lighting style as simplicity: "The more lights you use, the more confused the lighting looks. The simpler the lighting, the simpler it is to do and the better it looks. As soon as I get too many lights, I start all over again. If the lights start doubling up too much and I can't take them off each other then I get two or three shadows and it becomes too complicated. Simplicity in lighting is the basic thing. I

Continued on page 1196

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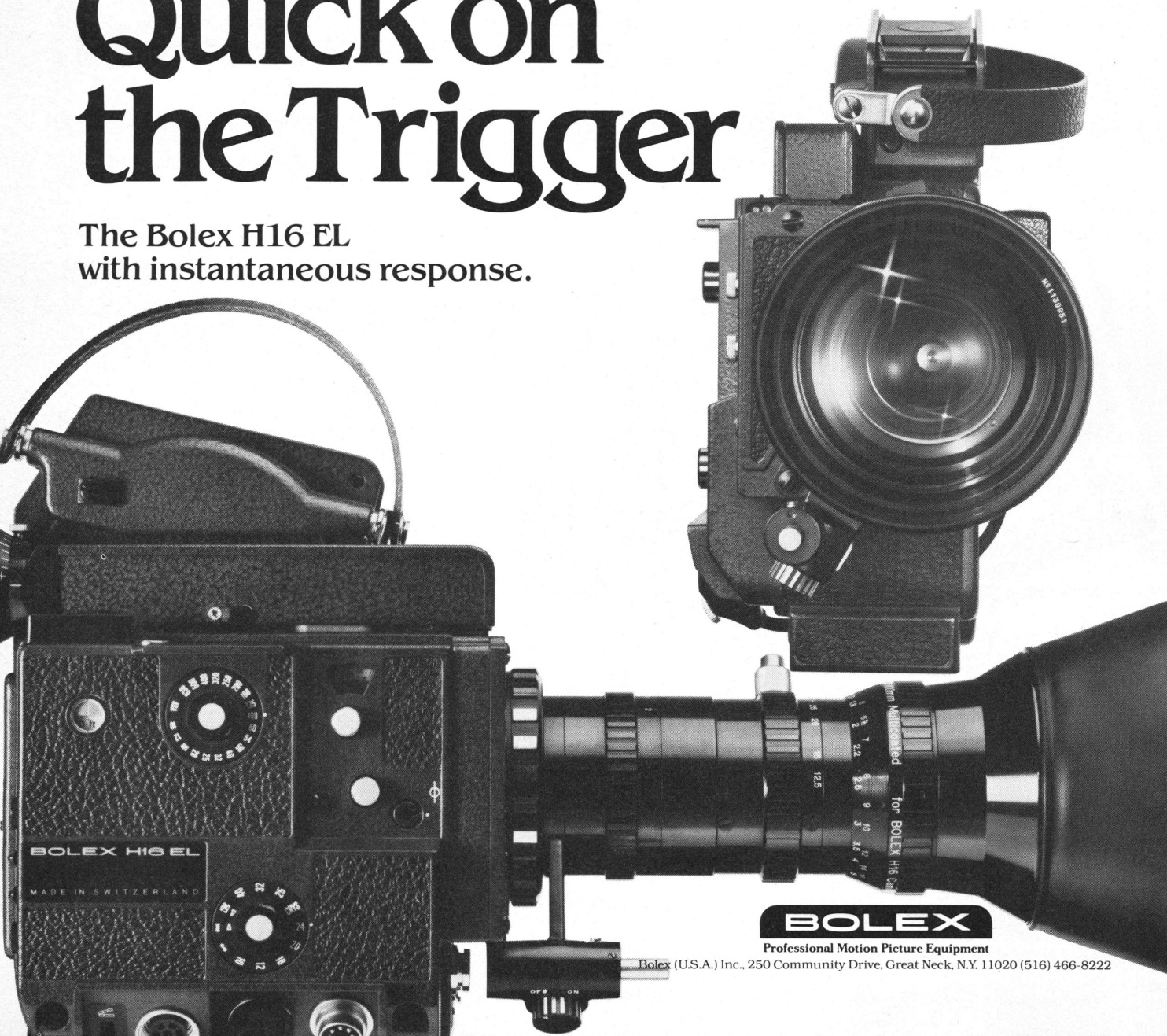

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Black & White Cinematography for Dead Men Don't Wear Plaid

Michael Chapman's "period" lighting of this scene between Rachel Ward and Steve Martin is typical of the way the stars were lit without reference to an apparent source in order to match the look of the older films.

by DEAN GOODHILL

DEAD MEN DON'T WEAR PLAID, the recent Steve Martin comedy, directed by Carl Reiner, is a spoof of the *film noir* of the forties and the gangster films of the thirties. The plot is a device designed to get Steve Martin into clips from 20 old movies so that he appears to play "scenes" with a host of great stars, from Humphrey Bogart and Cary Grant to Barbara Stanwick and Joan Crawford, to name but a few.

Cameraman Michael Chapman began work on DEAD MEN DON'T WEAR PLAID with a complete script and knew "every bit of old footage that was going to be used, and essentially how it was to be used and where," Chapman said in a recent interview. He knew that he would be expected to match the photographic styles of more than 20 different films, different cameramen, often on different film stocks, processed by different labs at different times. To a large extent, that could be dealt with. But, as we shall see later, Chapman was to discover that one of the photographic problems confronting him was very much beyond his control.

"It was," Chapman said, "a kind of archeology. We tried to dig up the old makeup. We tried to do everything we could to give ourselves a chance to reproduce (the period style)." Chapman credited the contributions of a number of veteran pros who had worked beside him on DEAD MEN. Among them, were his gaffer, Don Stott, Art Director John DeCuir (whose credits include NAKED CITY) and finally, their costume designer, the great Edith Head. DEAD MEN DON'T WEAR PLAID would prove to be Edith Head's last film.

PAINTING by NUMBERS

With credits that include THE LAST DETAIL; THE FRONT; THE WHITE DAWN; THE WANDERERS; INVASION OF THE BODY SNATCHERS; THE LAST WALTZ (he was the director of photography, the many other famed cameramen involved were there as operators), TAXI DRIVER and RAGING BULL, Chapman has proved himself to be a fine modern stylist. How had Chapman approached the enormous challenge of stylistic archeology? "Mostly just common sense," Chapman began, "One of the things I did when we got as good a print as we possibly could get of each of the old things, printed up as well as Technicolor could do it, I took frames and had them mounted on slides. Then, I had them build me a dark, black room on the corner of the stage with a projector and a good screen. And I had the screen measured so that I knew that it was 16-foot lamberts, or as close as I could get. And I would study them. I would look at it and think, well, the light comes from here, there's this much backlight, it seems as though there's that kind of contrast ratio, the shadows seem very dark, the shadows don't seem very dark . . . And I would just try to paint by numbers and match them. That was all I could think of to do. You know," he concluded, "if you're intercutting back and forth and you must match pre-existing stuff, your style, the amount of light and the

stop that you use almost become forced on you."

An introductory sequence takes us to a twisting mountain road. Lightning flashes. A storm rages. A car, dwarfed by it all, goes out of control and crashes. It's terrific footage, photographed by the legendary William Daniels, ASC, for a Spencer Tracy/Katherine Hepburn picture called KEEPER OF THE FLAME, (MGM, 1942). It was printed from original negative; one of the few instances where that was possible in DEAD MEN.

The first original scene in the film takes place immediately thereafter, in Rigby Reardon's office. Reardon (Steve Martin), a detective (naturally), is visited by Juliet Forrest (Rachel Ward). Reardon is sitting at his desk rimmed by a hard, hot backlight. Ward's sharply outlined, shapely shadow appears on the frosted glass door to Reardon's office. Aside from the fact that it's been photographed in black and white, this particular lighting style has been used frequently in various contemporary color films (BLADE RUNNER is a recent example, though the look was augmented in that instance by a great deal of smoke, with hard back light poured through it, creating shafts of often moving light).

Soon thereafter, Juliet and the hard-bitten detective meet in her elegant living room. The lighting is as glamorous as Ms. Ward (see photo). Note the practical sources: windows, covered with Venetian blinds; sconces on the walls. But the flattering light on Ms. Ward's face, seems unrelated to those sources. It was quite appropriately unrealistic. "Absolutely," Chapman commented, "none of it was meant to be realistic. It was meant to be real to the period movie, not real to reality. I mean, we did this thing of putting diffusion only in the closeups of the woman. Or we did stuff where, if we had a closeup we didn't necessarily follow the pattern of lighting of where they key light really should be to make it (the closeup) the most flattering."

He was dealing with a kind of stylistic tradition. "They're traditions now," Chapman agreed, "but at the time they were just trying to hustle out a commercial product to make money; trying to make some dumb chick look as good as she could, and so, even in a master shot they would, and we did to a certain extent, light her clothes and body with the normal light of the scene and then they would take cutters and completely knock the light off her face and totally light her face as a glamour shot, absolutely separately, with no law about where the light was supposed to come from."

PROCESS PHOTOGRAPHY

It was obvious that the auto interiors (see Polaroids of day and night scenes—the actor is Steve Martin's stand-in) were photographed on a process stage. When asked about it, Chapman said, "You know, you never quite believe they're driving in old movies. In a modern driving shot, you see the windshield. But in the old times you never used to see the windshield and you'd see the whole curve of a ceiling which, of course, you couldn't possibly see. You'd see this guy driving and there isn't anything in front of him. Somewhere, they found some of those old half cars; some old prop man had them."

The odd thing about working with the old prop cars Chapman used in DEAD MEN was that the actor that was supposed to be "driving" didn't know which way to turn the steering wheel, or whether to turn it at all, since he couldn't see the rear-projected image of the road he was supposed to be on. So, the actor would clutch the wheel, which was connected to a crank at the bottom of the shaft. There, out of frame, a prop man would sit facing the process screen, turning the wheel in whatever direction was appropriate to the rear-projected road.

"When you think about it," Chapman mused, "it's always a cheat when you do any kind of night driving shot, because there is no light on your face, really. All there is is a flash of light as you go past (an occasional source). But you can't do that . . ."

Chapman discovered his Polaroid to be an unusually valuable tool for exposure control in process photography. "In rear projection, one of the big problems is to try and get the exposure correct between the foreground which you are lighting and the background, which is already there. The old guys used to do it by eye. I didn't know anything about this; I had never done it. So, we had some big time rear projection men and they would sort of squint and they'd look at it and they'd figure and they'd say 'well, this is about right . . .' It seemed kind of primitive."

"So, I took out my Polaroid and I started shooting. You have to shoot off a whole lot in order to make sure that you get one where the shutter is fully open. If you get one where the shutter is half-closed, then the exposure is all wrong. I would usually take about five. I would have a whole bunch of guys around me and I'd hand them to them and they'd all wait fifteen seconds and pull. Somewhere in those five or six shots, you'd get one where the shutter (on the rear projection) was fully open and you'd know exactly your exposure. I would never do rear projection without it again. After a while, these old timers would come sneaking around. At first they were rather scornful at my doing this, but after a while they began to look at it and they saw it really worked."

Polaroid makes two black and white stocks. One requires use of a squeegee fixative following development, the other doesn't. Chapman tried them both and found that the contrast is better on the one that requires the squeegee.

In one scene, Cary Grant (in some old footage from SUSPICION) and Steve Martin appear together in the same two-shot. In this instance, rear projection presented special problems. "You not only have this old material, which is not necessarily in very good shape, but you've got to blow it up to be ten feet high, so it really showed. The one with Cary Grant worked pretty well, mostly because it was so dark—the interior of a train coach coming out of a tunnel—so we got away with a lot then. There's no way to degenerate half of the frame and not the other half of the frame. I even had half-diffusions and things and I tried to slip it over the half of the frame that he (Steve Martin) was in. But, it just never worked. There was another rear projection scene where they're in the same frame together: an over-the-shoulder shot to Ava Gardner; I guess it's from THE KILLERS, where he (Steve Martin) walks into a place called the Brentwood Club and he turns and he looks at a woman sitting at the piano: that's Ava Gardner. There were a couple of other rear projection shots but, by-in-large, rear projection gave it away too badly."

FILTERS

Chapman used a number two low contrast filter throughout the show. He also occasionally used various Mitchell diffusers. On exteriors, he used so-called cloud filters, various

shades of green and yellow filters that darken the sky (and anything else that is blue), thus making the clouds stand out in relief.

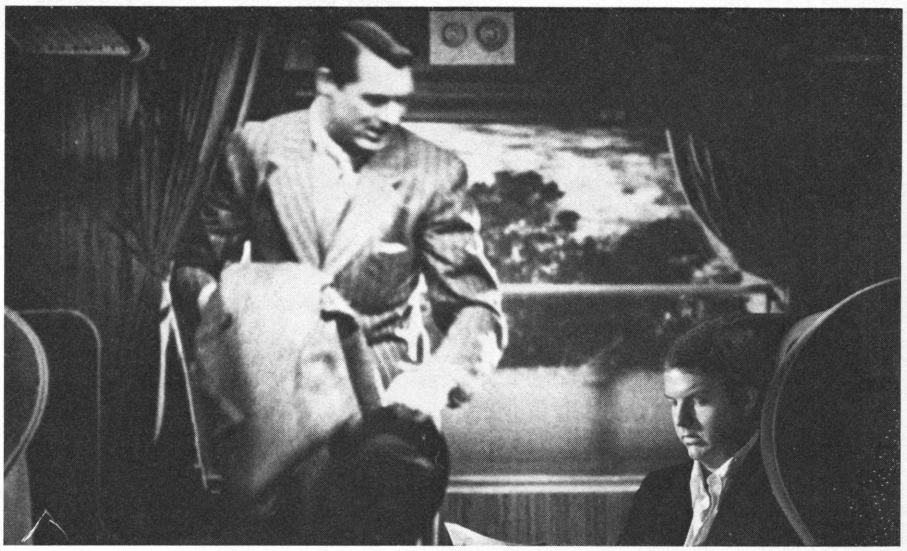
If you find the world of colored filters for black and white photography a bit confusing you are not alone. "That's one of those things that I don't know much about," Chapman admitted. "The old timers used to really know a lot about those exterior filters in black and white. There was an enormous mythology of hundreds and hundreds of filters, and this one did this, and this guy only used this, and that guy always had to have that. I think a lot of it was in their heads; psychological. But there was a huge, elaborate body of kind of a false knowledge about filters which is, thank God, totally lost. I don't have any interest in it, anyway."

Perhaps Chapman is right about much of that knowledge having been psychological. But, many people feel there are certain expressive qualities in the great old black and white movies that seem absent from most contemporary black and white films. It is a shame that the old timers' detailed knowledge about filters has apparently been lost (or is simply unavailable to this writer at this time); if only because, for now, there seems to be no way to scientifically study the matter for a definitive answer. Veteran cinematographer Milton Krasner, ASC, whose credits include such classics as ALL ABOUT EVE, says now he can't remember much about the filters he had used in his black and white days. When color came along, Krasner gave all his filters away, he didn't remember to whom, and forgot about all but the basics.

LIGHTING/EXPOSURE

Michael Chapman's approach to exposure is pretty similar to that of most other cameramen. "I read the highlights and I expose around them. I mean if I want it to be burnt up, I expose for less, and if I want it to be dark, I expose for more. And the rest of it I do by eye. The other thing you have to worry about is what looks right by eye in one shot, better look the same in the next shot. You've got to be consistent." Chapman sees no value in contrast viewing filters, save for looking at the sun.

Except for the well known fact that you can't separate foreground objects and/or actors from the background by color, Chapman sees little difference in shooting black and white. The "traditional" method for achieving such separation involves the use of the "rim" or "kick" back light on actors that appear in the foreground. This device became known as a fundamental trademark of *noir* lighting. It is a technique that provided an easy way out and became a Hollywood habit; one that survived long enough to become thought of as a style. But there are other more naturalistic ways to solve the problem. Separation can be achieved by controlling the relative tones of foreground and background elements. This need not be accomplished with lighting alone. Thoughtful consideration of how the color background walls are painted can help solve separation problems.



Cary Grant meets Steve Martin's stand-in in a Polaroid test of a rear projection shot.

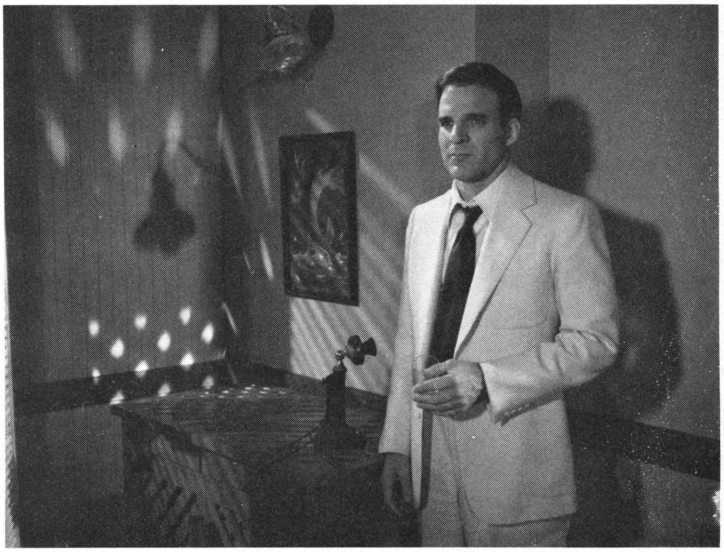
Polaroid tests of rear projection setups for day and night driving sequences.

Another solution to the separation problem is to stop regarding it as a problem and use it as part of the style. That's what Chapman did in RAGING BULL, and it certainly served the picture, giving it a gritty, verity look that was in perfect harmony with the painful, emotionally violent story of fighter Jake LaMotta's life. It was consciously photographed in the style of newspaper reportage; specifically, the work of Weegee. In fact, though, working in the close quarters of many so-called "practical locations," Chapman could not have set back lights even if he'd wanted to. There just wasn't any space (except in the boxing ring sequences, where his electricians manned a bank of dimmers so that, as his camera spun around with the fighters, the backlight was hot behind them, no matter where they turned. This surreal, visually heroic counterpoint to the otherwise gritty photographic realism of the film was, I believe, in keeping with the character's view of himself and his life). DEAD MEN DON'T WEAR PLAID was different in every way. As an aid in matching, Chapman had photographed Polaroid tests on almost every scene in the movie. He kept them pasted in a scrapbook. I found that they were far more representative of the timing he achieved in the finished film itself than were the publicity stills. So, we have decided to attempt reproduction of Chapman's Polaroids to illustrate a discussion about his lighting.

One can always find the location of a light source. The angle of the shadows will lead you to any given light's location.

SCENE 51

Again, the classic *noir* lighting is announced by the hot, hard kick light above and behind him. His face is lit by fill from a 1K softlight with a two foot snoot that projects fill without a lot of spill. It's one of Chapman's favorite tools for filling closeups. He calls it a 'Miss Francis' (the origin of the name is a long story). In this case, Chapman has placed the unit to the right of the camera with cutters to take it off the door, so it just goes to him. The glow on the wall behind the practical light comes from the light itself. The rest of the light on the wall comes from a deuce (2K) down the hall that rakes it softly. There are two 750's on camera left: one coming in on the wall and a second; close to the door, that hits the other side of his hat and gives him the other highlight on the left side of his face.

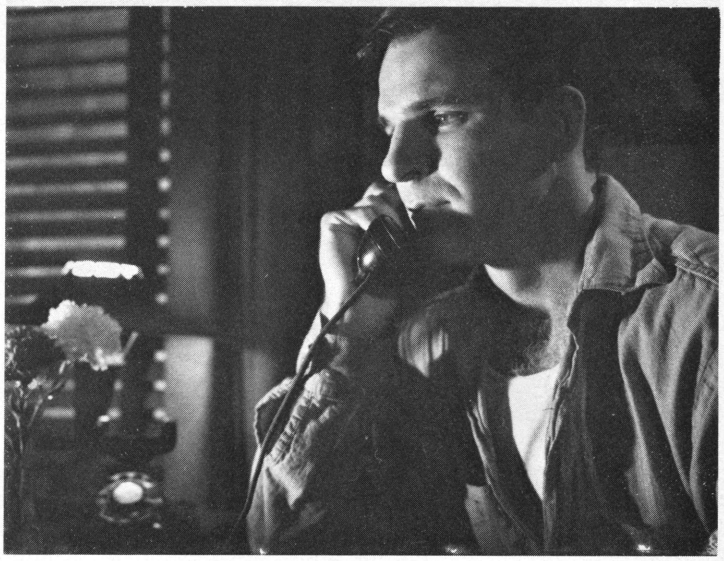


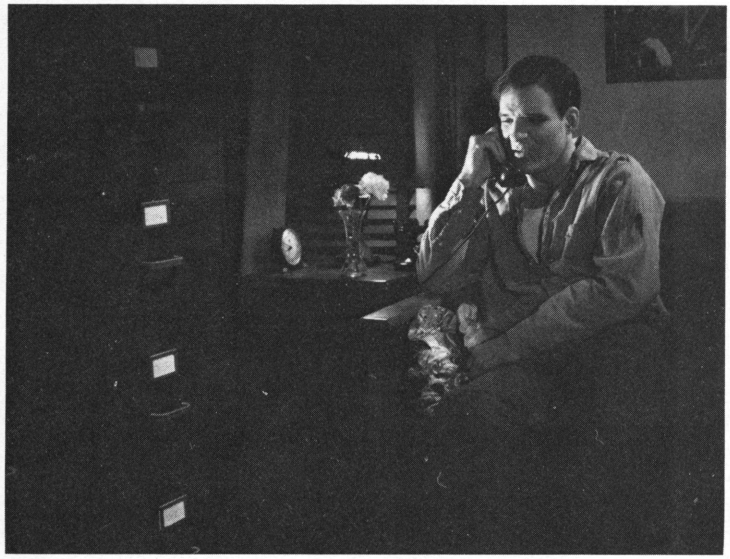
SCENE 228

This shot was lit to match an old clip with Robert Taylor and Ava Gardner. ''It drove us crazy to match that,'' Chapman recalled. ''We had to use that corner. There is an actual shot of Robert Taylor walking to this corner and picking up the phone. We had to have exactly this pattern, all these shadows. It was nightmarish. Apparently what they did was light it (the dot patterns on the far left) from inside this table here. That's the only way we could figure it out and that's what we finally ended up doing.'' The diagonal pattern to the near left of Steve Martin was created by a light and pattern mask placed high and to the left.

SCENE 218

This is part of the same sequence as the shot above. Steve Martin is talking to Reni Santoni. The lighting pattern is classic for a profile two-shot, according to Chapman. Each person's key light is behind him, on a floor stand out of frame, and comes in at a three-quarter or slightly flatter angle. The front fill comes from a large unit with diffusion placed high (note the shadow of Steve Martin's hat brim) and well back. The background characters (extras) were filled with a second unit from the rails above, with cutters to take it off the principal actors, so that the balance could be controlled. The fill used for the foreground actors would have carried back somewhat, but not so much as to interfere with balance control of the two areas. The shot is much wider than is indicated in this still.





SCENE 214

Note both wide and close shots. The little lamp on the table is the practical source. In fact, he's lit from a light behind the filing cabinet which is hitting him on our left, but which is cut off of the flower and the lamp so it doesn't shadow itself. The fill is from the rails, high above with some spun glass as diffusion. "There's always diffusion, just about; spun glass in everything. Occasionally I'd omit it for some back lights, when I needed the punch."

SCENE 133

This scene was lit from slightly below in order to make it somewhat more ominous, because Steve Martin (sporting a tissue in this rehearsal shot to protect his collar from makeup stains) is about to get beat up by the two thugs. Further forward, to the right (out of frame here) is a desk where, in the reverse shot, Kirk Douglas is standing. The desk lamp is the practical source. The actual key is a low floor unit low to camera right. The overall backlight comes from the rails above. General fill is provided by a Miss Francis near the camera.

SCENE 215

The scene begins wide as Rachel Ward comes around the corner and continues to camera left as she goes to a medium shot in a phone booth, camera dollying and booming with her. There is an brute arc high to camera right. A large unit was placed inside the window to her left (note shadow pattern on the sidewalk in the foreground). Other than that, Chapman just used a kind of overall fill. The scene was shot in special-effects rain.

GRAIN AND CONTRAST

There are two black and white film stocks available in the Kodak line: Plus-X and Double-X. Chapman had photographed RAGING BULL on Double-X, but decided to use Plus-X for DEAD MEN. "Plus-X was closer to the old stock. It was slower and had finer grain, which was going to be helpful since we knew that we were going to do a lot of futzing around with it afterward, and it had a softer contrast than Double-X. It just seemed to fit with the older stocks."

When matching new footage to the old clips to be cut in, Chapman was faced with two problems. "One was to make what I shot match the old stuff within a given scene. And then there was the separate problem, which was to make it all fit together, so that it looked like one movie. And they are different problems. I think that in matching from cut to cut inside the scenes I did pretty well. In making it look like one movie all the way through, I don't think we did all that well. We did the best we could."

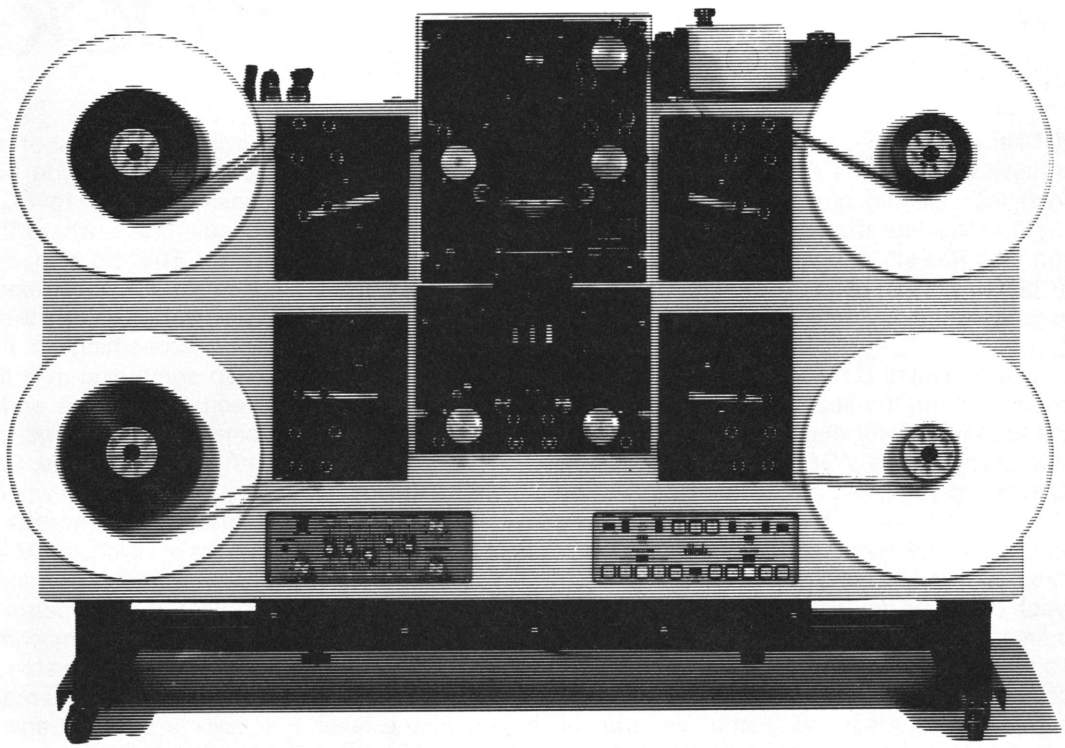
The problem, was that, typically, anything close to original negative for the old footage he had to match wasn't available. "Some of the old clips were from original negative, a few were; the ones, obviously that looked the best. Some were from God knows how many dupes, some were from positive prints, from which negatives had to be made. I'm not sure that some of them may have been from 16mm and then blown up. There is no rational system for where all those old negatives are. Many of them are destroyed. So, there was no one kind of (negative) material to deal with, which is why the matching is of varying degrees of success, frankly. I was just sometimes lost. I would have had to degrade the modern stuff so unbearably to make it match the very best quality that we could get from the negative we had, that it seemed silly. I had to sort of swallow my pride a little bit, in some cases. I didn't know that, frankly, when I started. We didn't know. We kept thinking, well, maybe we'll find a better print somewhere, maybe we'll finally find the original negative somewhere, and they kept scrounging and hunting and occasionally, I think, we did find, at least, better prints or a better bit of dupe negative to go from. So, we never knew, until we were actually shooting, how bad it would be.

"If you noticed," Chapman continued, "the intercuts at the end are all from a movie called THE BRIBE and that was one of the very best matches in the film because that was from original negative. I don't think you can tell where it is intercut, in that case. I wish I could say it was all my magic. It isn't. It's just that it was an original negative to print from.

"We did degrade our original footage to varying degrees. If you noticed, there were some places where it didn't quite match and then there will be the beginning of a dissolve, which means one more generation, and that one more generation suddenly makes it match perfectly."

In DEAD MEN in all the old clips, to a varying degree, there is much higher contrast and a concurrent loss of detail in the shadows and highlight areas, obviously due to generational degradation. Chapman discussed the possibility that he might have been better off if he'd used Double-X. It would have given him more contrast and grain from the start and would have more easily matched some of the old clips. But then, it would not have matched as well for sequences where the original negative was available. Chapman said he had tested both stocks. It comes down to the fact that he was in an inconsistent situation and he did not want to degenerate to the lowest common denominator.

"You know," he went on, "I am no technician. Never pretended to be. I did DEAD MEN entirely by guess and what looked right and just fiddling, which is all I've ever been able to do. I've no background in chemistry, or in film, for that matter. I never was a still photographer. I couldn't develop a roll of black and white film. I know you go like that," he said, grinning and agitating an imaginary developing tank, "and then you hit it to get the bubbles out and that's literally what I know. I'm not saying I didn't have an image in my head of what I wanted it to look like, but that had nothing to do with technology. I wish desperately that I were much more technologically adept. I know that I could do a lot better if I were. Thank God there are labs and people that know how to do that stuff. I really do wish I knew much more chemistry, because I know if I did there are a lot of things I would dare to try that I don't because I don't know enough. Anyway, on DEAD MEN DON'T WEAR PLAID, I really didn't have any great technological secret about how to do it. There was no way to make an overall scheme." ■



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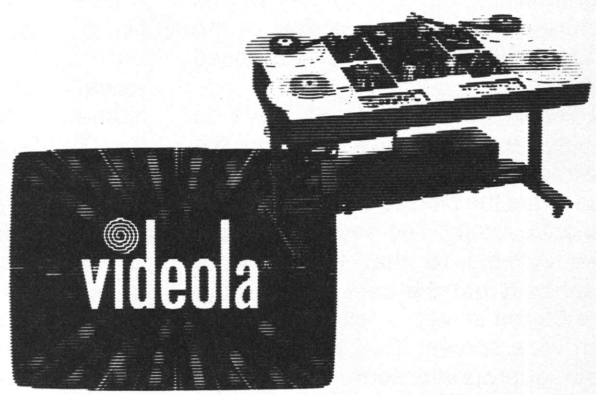


MANHATTAN

Black and

by DEAN GOODHILL

"To him," says Woody Allen's voice-over during the opening montage of MANHATTAN, "no matter what the season, this was still a town that existed in black and white and pulsated to the great tunes of George Gershwin."

The line was written when the film was in post-production, but it reflects a sentiment that Woody and his longtime collaborator Gordon Willis, ASC, had shared; one that crystallized as they began pre-production on a film that is, perhaps, the most romantic big screen vision of life in the Big Apple that anyone has ever made.

Willis' extraordinary career reveals

Gordon Willis is so good at finding the right look for any given story, that one could easily assume it's second nature to him. But, that is simply not true. "I've always found that the hardest part of making a movie is making a decision on what's supposed to happen photographically in the picture," he said. "I tend to think about it for weeks before I start, sometimes up until the final day, and even sometimes up until the first shot, before the final idea settles. A lot of it, obviously, has to do with the story and the location where the story takes place; and then, finally, what is the picture supposed to be—not photographically, but the totality of the picture—what is the final feel of the whole movie put together supposed to be?

"There are all kinds of ways to shoot the city of New York. In the case of MANHATTAN, the concept was to lay the picture out in what I call romantic reality. The second decision after coming to that was how to graphically get the best visual structure on the screen. I felt that Panavision wide screen, 2.35 to 1 was the most appropriate form. I like wide screen, because of the way you can use it graphically. That was superimposed on the basic idea of romantic reality. Put them together and you have something that was, in my opinion, very workable and quite good looking at times. It was a better way to deal with scale; people in the city, and the city in itself. One thing leads to another until you can finally build a case for what you're doing and make it appropriate for a picture."

How did he convert the general concept of romantic reality to the specifics of lighting and composition? "Well," he said, "everything is based on selectivity. I mean you can look at one thing one way and it's going to be something, and you look at it another way it's going to be something else, so you make the choices that are going to enhance the story. You look for the things that are going to be charming, and you look for the things that will transpose well at the level that you're trying to speak to the audience. You look for all the things in this movie that were by nature the romanticized visions of Manhattan. Then, within that structure, you have to interpret properly related to lighting and camera work. You don't set out to make things ugly; you set out to make things romantic, charming and good looking. I would say that your major tool in any movie is selectivity, the choices that you make. Once you make the right choice, then the rest is a *fait accompli.*"

By shooting this kind of an intimate film in scope, Gordon Willis put the lie, once again, to one of those tired old saws—that Cinemascope is not for intimate or personal films. As he puts it: "That's a concept made up by people who sit in studio offices. You know, I shot a lot of pictures in Scope. I shot KLUTE in Scope, I shot PAPER CHASE in Scope. On all of those I had to sell the people I was shooting for because I, personally, thought there was great value in the format for the movie. It had nothing to do with seeing it wider; there was probably only picture I shot where I felt Scope meant something in that category (COMES A HORSEMAN). Intimate movies can be shot really well in Scope because you have so many choices related to using people in space—that's where it's quite wonderful. The closeup in Scope is a closeup. You can make it better in many instances. It's the graphics that mean something to me. That can mean something in a little room between two people and it can mean something in a large shot of a city with two little people. Scope is a very, very good medium when it's not used to machine-gun horses on a hillside."

Willis's vision for MANHATTAN involved a number of situations where he wanted good depth of field. That can be a problem with anamorphic lenses which have somewhat shallow depth-of-field. Willis makes it a policy to pick a stop for any given picture and stick to it all the way through the show. On MANHATTAN, given all of the above criteria, the stop was 5.6 for interiors, though "some of the night work was shot at wider stops," he admitted. Because of his need for this relatively fat stop, he picked Kodak's Double-X as his negative stock. It's their fastest black and white stock (250 ASA in Daylight, 200 tungsten). Even with a stop like 5.6, anamorphic lenses do not produce great depth-of-field. "You can stop those lenses down all the way and still not get anything depthwise, depending on what the shot is. But, you use it to your advantage, aesthetically. You tend to structure things so you can get the most out of it."

Gordon Willis likes to use Mitchell-type diffusers, "to just soften the optical quality of the lens on occasion." Pancro manufactured the filters he used on MANHATTAN. On exteriors, he also used K2 filters for minor black and white tonal correction, as well as various neutral densities when necessary.

It is common knowledge that, since black and white is rarely used these days, there are certain problems with the laboratories when one sets out to

White Romantic Realism

do a feature that way. According to Willis, "You always have trouble with laboratories no matter what film you're shooting. Black and white tends to be a lost art, even though, in my opinion, it's the simplest form of lab chemistry. You don't have the people around that had the experience of doing black and white. The reason you don't is based on economics, because laboratories don't make that much money on black and white, so it doesn't pay for them to keep a black and white operation going for original negatives. They all have them for dupes and things. When you start out to do a black and white movie you're sort of digging coal for awhile until you get it all together. I've been fortunate because I've been able to go through several laboratores and get basically what was necessary. But, I'm fairly knowledgeable in the lab area. With MANHATTAN, a laboratory in New York by the name of Guffanti—basically a duping lab—did the negative. Technicolor, in New York, did the printing."

Interestingly, though he shot MANHATTAN on Kodak's Double-X, Willis specified that release prints be made of Agfa's positive stock. It is a mixture common to many top still photographers working in black in white. Agfa's black and white motion picture print stock, like their enlarging paper for still use, contains more silver and produces noticeably richer blacks.

SELECTED SCENES

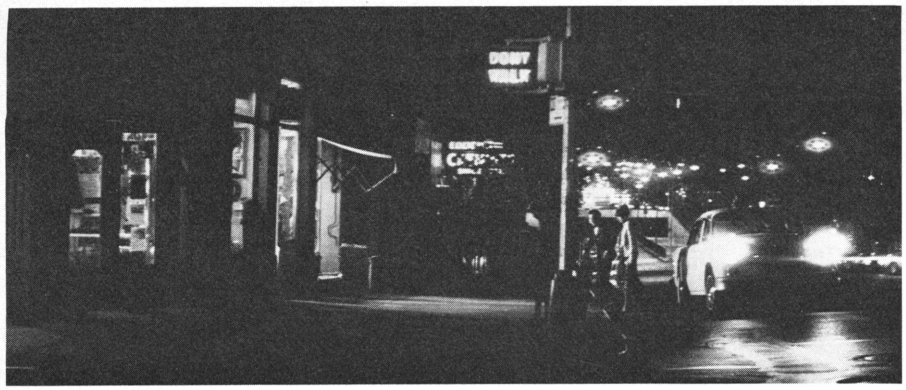
NOTE:These still reproductions were made from an actual release print of the film. The 4x5 inter-negatives were made by placing this release print in an enlarger with a 50mm Todd-AO anamorphic lens. Because of the nature of the process, the internegative had to be placed in the enlarger emulsion up when the 8x10 prints were exposed. A halftone negative was then made from the print. Though every effort has been made to retain optimum image quality, a good deal of generational degradation was inevitable. The tonal range of these images is much greater on the screen than can be reproduced in our magazine.

FRAME 1

This is the logo of the film. "It was shot at about 4:30 in the morning, just as it started to get light. We did about six takes within a 20 minute period. The only thing (added to the natural lighting) is we had the bridge lights left on. Some of them I did without a grad, some I did with a grad, because, as the sky got lighter I started to use the grad to hold the sky down. But it's all obviously played for silhouette. The exposures were laid more or less on the sky and the sidewalk, that's where the keys were related to determining what the exposure would be. Now that's not an exposure that we take literally. The shot was two stops underexposed—two and a half, actually." This was one of many instances where Willis had indicated shooting well under what would have been considered the correct, or "key" exposure. "You can't reproduce, literally reproduce, an exposure on the screen if you want a given effect. It's based on relativity, because your eye is selective; film isn't. I mean, you can put it wherever you want it. So, in order to get it down, you've got to underexpose.

—It is not possible to get the same result simply by printing it down according to Willis, "because you only have a certain range that you can

Frame 1



Frame 2

Frame 3

print something down. Even if you do print it down, you're not going to get the same thing. Your negative is going to be too fat and you're not going to achieve the basic quality of what it is that you're trying to get on the screen.''

FRAMES 2 THRU 6

This is the beginning of a night exterior scene that covers one and one half city blocks in one shot with no coverage. To illustrate the lighting of this scene, five frames from different moments were chosen. The lens, to the best of Gordon's recollection, was a 100mm. The camera was mounted on a gimbal, a device consisting of a ring or base on an axis which permits an object, like a ship's compass, mounted in or on it to tilt freely in any direction, in effect, suspending the object so that it will remain horizontal even when its support is tipped. This, in turn, was lashed to a Western dolly (essentially a plywood platform with four, wide balloon tires). The image was protected against vibration with a Dynalens, a gyro-driven optical device that instantly corrects any bump with an equal but opposite bump.

If he were doing the shot again now, Willis feels sure he would move the camera the same way; he would not do it with a Steadicam. Why, I asked? ''It's a tool, and there's an immediacy about that tool, the Steadicam, that was not something that I felt was appropriate for the shot. First of all, I didn't want that kind of floating going on in the shot. Yes, you can do it that way, but the bottom line is, what does it feel like when you see it on the screen.''

Willis had never used that sort of rig before, and he said, ''I never have since. I mean, the sidewalks in the city are not level; and this one happened to be going downhill as well, and then around the corner on this specific shot. I had a traveling light on a dimmer which I had to deal with as well. Those things could be done without a Western, and without a gimbal and without a Dynalens; all of them. You could simply take a Steadicam and walk the light. But you're walking for a block and a half with human beings. Somebody has to carry the camera. Somebody has to carry the light at night. If you get into 10, 15 or 20 takes, someone's going to get tired. The actors are tired after walking that long. So, you're not going to get the same improvement from take to take mechanically. If anything, it'll go downhill, not uphill.

''What you're looking for is how best to accomplish the shot and achieve what you want. Then, finally, what is it you want? I mean, do you want it not to become camera conscious, or do you want to get it done in ten minutes and get on the bus and leave? The bottom line on this decision is I wanted to be very specific about how we dealt with it. There's a lot of lighting in it. We needed an easy going shot with two people that were walking and talking.''

FRAME 2

This frame is taken from a point shortly after the scene begins. Woody and Diane Keaton have just gotten out of the taxi on the right and are just walking toward the sidewalk. The only thing that Willis did was to put a 2K in the store to light their exit from the cab and their walk up onto the sidewalk. Other than that, the rest of the light is available street lighting and the natural source light in the store. ''But it doesn't necessarily mean that I was working on key,'' he is quick to point out, ''I may have decided, in this particular case, people may have been a stop underexposed. It's all based on relativity. You want to give the impression that the light that's in the store is brighter than the one that's lighting them. But generally my approach would be to use the basic exposure more on the store lighting itself, and only use what's necessary to augment them, but in a lower key. I'll set a given exposure level that I want to function at, but it's not by eye. I generally get the exposure level of where I want to function with my meter, and from that point on I go down and set this one and that and that and that, and that and that, etc., etc. But generally the philosophy is to use relativity; meaning, where the source is should be brighter.''

That means that if they're, say, a stop and a half ''under key'' where they're standing now, just heading for the curb, by the time they reach the pool of light in front of the store they ought to be about a stop under. The ''correct'' exposure exists only inside the store (into which the actors never go), produced by the natural source light. The hidden 2K within the store simply augments that light so that the actors on the sidewalk are realistically lit within the latitude of the film. The human eye could see them without such augmentation but, of course, the human eye has vastly

greater latitude than any film yet produced.

FRAME 3

They have already moved across the sidewalk and toward camera to where they're now crossing the street. The camera has not yet started to move, but the operator has trimmed up on the action as they came forward by tilting down and panning left. This is, of course, the same store as in shot 1, and all the light within it and the telephone booths on the sidewalk is natural source light. However, the actors (Woody and Diane Keaton) are now crossing the street. Without some help they would be in distant silhouette for a long time. They will be allowed to go into darkness on a number of occasions later in the scene, but now is not the time. They are too far away and it is too early in the scene to allow that. So, Willis placed a 10K down the street to the left. This particular frame was chosen to illustrate this lighting because they happen, for this brief moment, to be looking toward the light. For most of their walk across the street, however, they were looking straight ahead, so that only half of their faces were lit. But again, they were probably about a stop to a stop and a half under; "nowhere near key, so to speak."

FRAME 4

Woody and Diane have now walked onto the sidewalk, the camera has been moving for some time, and they're going in and out of pools of light, sourced from the shops on the left. Willis had made arrangements with several of the shop owners to leave their lights on for the night Sometimes, Willis augmented source light with 750's when he thought it appropriate. There is also some backlight on Diane that is coming from passing cars, which was not always happening in the shot. In addition, remember that he had mounted a 4K softlight on a dimmer, traveling with the camera.

"So, what I've done principally is, where I want to change the lighting pattern, for instance, when they get deeper in the shot—and #3 is an example of it—is that the light you're looking at, the primary light you're looking at there, is actually a camera light which is being worked on that dimmer all the way down the street. In some cases, as in 4 and 5 for instance, that light's not functioning,

Frame 4

Frame 5

Frame 6

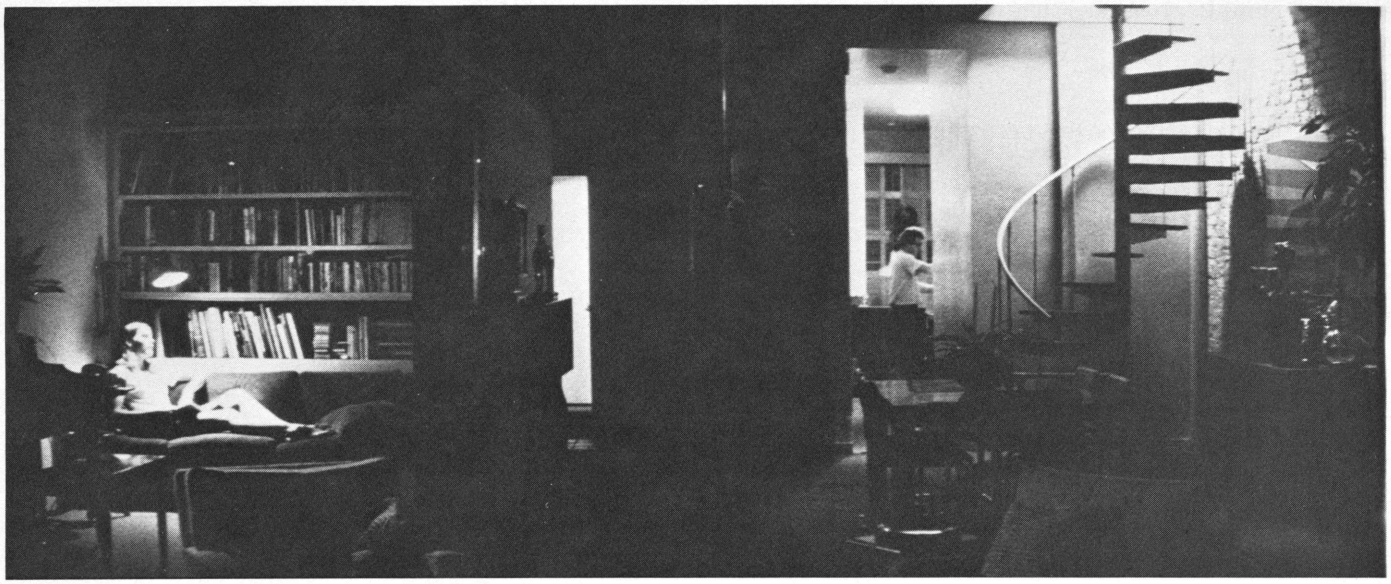
it's down on the dimmer. Then, in some spots, where they hit very dark areas in the streets I let 'em go dark, but in other cases I brought the camera light up to an appropriate level."

FRAME 5

Woody is completely in silhouette and there's just a tiny little bit of light on Diane's face from the store to the left. Only a few steps further, they will come into considerably more light. "In some sections, I just let 'em go black for a little bit and then bring the light up on the dimmer for a beat or two, and then back down again as they come into other lighting." Willis planned when and how much the camera-light would be on, and ran it for Woody with stand-ins. Then, if Woody approved, it was set.

FRAME 6

This is the end of the scene. Woody and Diane have walked a full block, turned the corner (the blur of a taxi is visible at the corner in the background here) and are half way down this block as the scene ends. In this situation the highlight that we're seeing on Diane Keaton's cheek is coming from the store (a deuce with some spun on it, in this instance because it had to be back deep). The fill is coming from the light that's traveling.



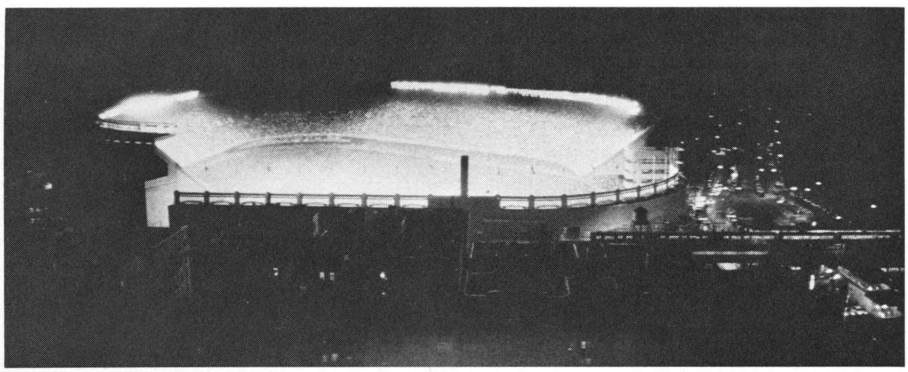
Frame 7

SCENE 7

In the beginning of this scene, Woody Allen comes down the spiral stairs to the right. The kitchen lights are off at that point. He walks into the kitchen, flips on the lights, goes to the refrigerator, which is where he is in this frame. All of this time there is dialogue with Mariel Hemingway, who is over on the left, and it's all played in one static shot with no coverage. When he walks over to Mariel Hemingway, the camera does not make any adjustment at all, they just play it in that area. This is an excellent example of using space in the wide screen format. "It's fun to put people at opposite ends on occasion," Willis commented, "and especially in this case, where you have one person talking to another where they can't see the other person. It has a tone and an emotion to it which is fun for an audience. It's quite wonderful to sort of reveal things piece by piece in a shot like this, where one person is established way on the left and then you finally start revealing other people on the right related to the lighting. It's just a good graphic, in my opinion."

The lighting was very simple. There was a unit at the top of the stairs, bounced off the ceiling to create a soft, general overall light washing down the spiral stairs. A second unit was placed in the kitchen, bounced off the wall to the right (out of frame, of course). This unit acted in conjunction with the practical ceiling light that is visible. Generally, Willis has his gaffer disconnect the cue switch and tie the practical and the augmenting unit together so that they can come on at the same time, when the actor flips the (now disconnected) switch. Looking to the left of Woody, there's a light in the background on a door which was on from the beginning of the scene and provided a sense of depth and proportion. The lighting on Mariel Hemingway is, for the most part, the practical that's visible overhead. There is just a little bit of fill, visible on the bookcase now that fills Woody when he crosses to Mariel and sits. To the best of Willis's recollection, that unit was a 750 placed well back and to the left, with cutters and barndoors to keep it from spilling too wide. As to the bulb in the practical, Willis reveals a distinct lack of mystery. "What I do is, I'll take house bulbs, any standard house bulbs—100, 150, 75 watts—I carry a whole selection of them, depending on what I need exposure-wise when I'm working, that's what I put in there."

Frame 8



FRAME 8

This was one of many spectacular shots from the opening montage of the film. *Rhapsody in Blue,* which is playing under the entire montage is, at this moment, reaching a rhythmic climax. The movement of the subway with the stadium in the background makes for a really unforgettable moment. It was shot from the room of a building overlooking Yankee Stadium. Clearly, the big challenge here had to do with exposure balance between the bright light in the stadium and the dim light in the subway and on the street.

"All you've got to do," Willis reported, "is cut the exposure in the stadium down so that you can expose for the subway and the street and then, finally, end up with both of them on the screen. The quickest way to do it—and I do it all the time with that kind of thing—is to simply use a graduated filter or a piece of neutral gelatine in the spot that I have to use it, depending upon how much exposure I want to cut down on a given object. If it's a gel, it is taped to the matte box. If it's a grad it's put in the matte box into the level that has to be held

Frame 9

down.'' There is no problem about seeing the sharp line of a gel as long as the aperture is fairly wide and the gel is sufficiently close. ''If you don't have a stop that's lean enough for that, then you got to apply enough neutral density within the camera to bring a stop up so that you can do it. Then, you're talking about daylight problems. This shot was made wide open, and I believe the ND that I used on the stadium was an N-6.'' Sometimes, Willis will cut get with a scissors to make an edge ragged, but in this case it wasn't necessary. Once again, the graphic qualities of the scope aspect ratio are obvious here.

FRAME 9

This is the first scene after the montage at the beginning of the film. It was photographed in Elaine's, a popular Manhattan restaurant. From the left, we are looking at Mariel Hemingway, Woody Allen, Michael Murphy and Anne Bryne.

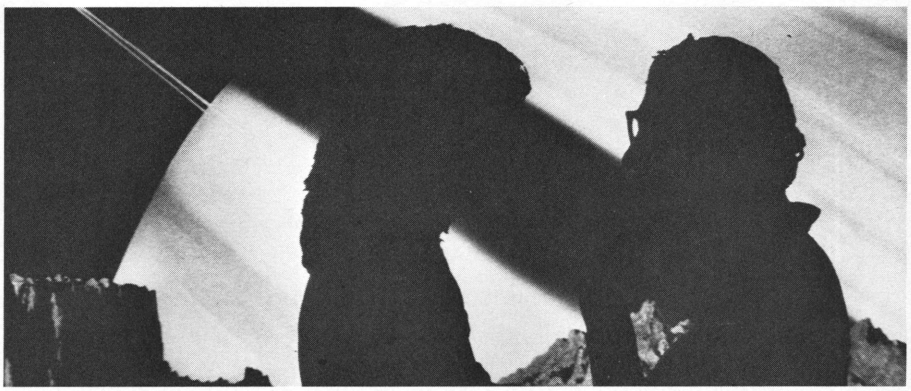
The lighting, as Willis is quick to suggest, is relatively conventional. He used a unit over the whole table called a ''baylight,'' a rig he developed in the middle of shooting GODFATHER II that has ''broken out like the plague all over the business now.'' In its most primitive form, it looked like a chicken coop (in fact, many cameramen now call them ''coops'') with any numbers of photofloods inside, and a layer of diffusing material beneath. A duvetyn (heavy black cloth) skirt surrounds the unit and can be set at different heights around its perimeter so that the light's spread can be controlled. ''It started out that way, then was redesigned. It can be moved around and hung up on ceilings or bolted directly into a ceiling, or strung over a set. The basic design (as it has now developed) is two frames which are roughly four by four. One frame contains the lighting unit. The second frame, which contains the diffusers, is suspended on four chains below the units. It can be moved up and down, relative to the lights, not only to accommodate the diffusion and make the lights harder or softer; but the primary reason (for this mobility) was, at first, to be able to move the bottom unit up, if necessary, if we needed more headroom. We used chain similar to a toilet chain—you can just move it up link by link to give you enough headroom so that it's out of the picture. All kinds of refinements have been made to them. A lot of grips in the business now have added their own little touches; like the skirts can be held on by Velcro—that way they just rip right off if you don't need them.''

The scene was photographed at a 5.6-stop with a 100mm lens. But everything was deliberately a stop under; so the ''actual key'' (the ''correct'' exposure) came from the crosslights at a 4-stop. He was getting a 2.8 from his overhead baylight. The light for Woody and Mariel is from a floor unit behind Michael Murphy. The unit that takes care of Michael Murphy and Anne Byrne comes from high on the wall to the left behind Woody. Another unit back to the right takes care of the people in the background. All of that cross lighting was ''glued together'' with various nets and cutters so that it falls at the appropriate levels.

FRAME 10

This sequence, the interior of a planetarium where Woody and Diane Keaton have been driven after a sudden rain storm, was particularly interesting in many ways. It was a series of visual vignettes strung together by a continuum of dialogue. The characters would appear in outer space settings that were, in every instance, brighter and more commanding then

Frame 10



they were. After a few moments, they disappeared again into the blackness of a fade-out or a cut. It made one feel that these were two small people, 'strangers in the night,' as it were, suspended in space and time. It was a sequence that managed to be otherworldly without falling into self-consciously, surreal stylization. It was, after all, the purported interior of a planetarium. Technically, this sequence looked simple. It was as if the filmmakers had simply entered the planetarium, set a few lights and shot the scene. Nothing could be further from the truth. Gordon Willis discussed it in some detail.

"These graphics aren't really in the planetarium. We wanted to create a bigger-than-life illusion on something that was fun and fatter than real life. So, the sequence is built out of props and mirrors and stars and mirrors, and big models of the moon and things like that.

"This particular shot is a matte shot. What we did is, I photographed them in silhouette against a blue backing. In doing a thing like that, and all the matte work that I have done, the general thing is to shoot the background first. Then, I used the background in the camera to position the foreground. In other words, you cut a matte of whatever the background is and you physically install it inside the camera so that you're looking through a positive, so you know what you're putting your foreground against. They (the backgrounds) could have been anything (in subject matter or actual size). But in this particular case, I took this graphic of Venus and used it to play this section in silhouette.

"I thought it was interesting, to cut him in partial silhouette; and to deal with her caught in the ring, as opposed to doing it the other way, where you see them both clean. But it was an interesting sequence because it was all manufactured. There was no planetarium like that available at the time."

In the first vignette, Willis used a mirror to put stars in the sky above a seemingly vast, barren moonscape. Mirror shots are nothing new to him. "I use a mirror on occasion to do certain things because it's better than laying an optical on it, and adding another generation. Depending on what it is you want to do, usually a 60% mirror, sometimes a 30% mirror—meaning that it's partially silvered. You put it in front of the camera so that you're shooting the action through the mirror. Now, what you want to impose in front of the action is reflected into the mirror. So, in this particular case we sprinkled some stars (actually small Christmas tree lights) on a dead black background. The mirror is vertically correct. I mean, it's turned at a 45° angle, in this case, so that you can pick up the reflection of what you're trying to superimpose either to your left or to your right; depending upon how you set the mirror. The actors are where they would normally be while you're shooting. The star field, or whatever else you might choose, is over to the left or to the right, reflected in the mirror. "It's the same thing as simple matte work, which is a foreground process," he explained. He used a mirror in ANNIE HALL, too; there's a sequence in the bedroom where Woody is trying to make love to Diane Keaton, and in the middle of the sequence, her "ghost" gets out of bed, commenting on the action. "It's an interesting sequence if you know it's been done with a mirror, because it all takes place in one shot." ■

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generally use small units to cover small areas rather than taking a big unit back to light the whole thing."

A lighting set up by Lathrop can get as simple as two units. Some of the tests he shot for HAMMETT to establish a lighting style for the picture involved Hammett at his desk in a temporary set for his apartment. Lathrop lit the scene with 50fc from one senior or a 10K coming through the window behind Hammett and a minimal amount of fill light bounced from behind the camera or coming from a soft light with diffusion on it. Lathrop pushed the film one stop and shot at f4.

All of the footage Lathrop shot for HAMMETT was force developed one stop. First of all Lathrop likes the look he gets with forced development of 5247: "Forcing one stop gives you a certain look on a picture that you can't get if you don't force. I don't know what it is. The shadows go a little more contrasty but there is detail in the areas that you want." Lathrop is quick to add, however, that with the new negative stock (5293) he would not have to push it. He would still light to 50fc and shoot at f4, because he likes the amount of depth of field he can get at f4 and because his eyes are accustomed to working with a 50fc key. Like most cameramen he will measure the level of his key light with a meter and then set the rest of the light levels in the scene by eye. Although he knows what to expect when lighting to higher levels, he finds it easier to evaluate lighting ratios by eye if his key light is 50fc. Another factor which affected his decision to force develop the film was the way in which the sets were constructed on the stages at Zoetrope. There were so many sets crammed onto the stage and they were constructed in such a way that Lathrop knew he would have trouble getting more than 50fc or even 25fc of light onto portions of them

Lathrop used 50fc for what he calls "full key" on HAMMETT. If a person was to be more subdued in a background or in a night scene, he would light them to 25fc or "half key." The scene where Hammett discovers Crystal Ling in his apartment was lit half key to create the effect of a low light level in the apartment which is illuminated only by light coming through the blinds on the window. In order to create an appropriate ambient light level, Lathrop used a 500W "half broad" with 2 or 3 silks on it so that it did not cast any shadows. Had this been a night scene in the apartment with only the light coming through the window (from the moon or a street light), he would not have used any fill light.

The key to Lathrop's lighting style is the creation of shadows or shadow areas. It is as though he thinks in terms of using lights to create the dark areas of the picture rather than to illuminate the scene. The best example of this is probably his approach to the scene in Hagedorn's (Roy Kinnear) bedroom. Hagedorn's bedroom was not a room which called for sketchy lighting. It was the sort of room that would be well lit and fairly evenly lit. This does not mean however, it has to be lit flatly. The master shot for the scene was a fairly wide shot of the room with Hammet (Frederic Forrest) and Hagedorn sitting in the foreground. The punk enters through the door in the background and hides behind the Chinese screen and then a fight breaks out in the middle of the room and Hagedorn shoots the punk. The room has two hanging lamps over the bed and a small lamp on top of the dresser in the background. There may also have been a floor lamp that is seen in a reverse angle. With the hanging lamps as the principal source of light on Hammett and Hagedorn, Lathrop was able to light them with a ¾ back light coming from juniors just above the top of the set. There was one unit for each actor and each probably had some kind of scrim on it. Lathrop used no fill light from the front at all giving the image rich shadow areas. He justified this choice by citing the fact that there would be a wall where the camera was and no light coming from that direction. The only other lights were a top light on the bed to give the effect of light from the hanging lamps, a light on the wall behind the lamp on the dresser to create the effect of that lamp and a light for the punk when he enters the room in the background. The punk was probably half key rather than full key, and the light on Hagedorn took care of the action around the bed. Hammett's key was flagged off the bed. Lathrop estimates that it probably took an hour to do this set-up and the action covered some five pages of script. He used the same lighting for the close-ups on Hagedorn and Hammett with perhaps a slight adjustment for Hammett's close up. He probably added an eyelight for the closeup on Hammett, using a midget with a snoot on it.

The net result of the lighting in Hagedorn's bedroom is a room which appears to be fully lit and yet has shadow areas that are consistent with the overall mood of the picture. A lighting set up with front lighting which eliminated the shadow areas on the front of the actors and the front edge of the bed could be perfectly naturalistic, but it would not have contributed to the mood of the picture. The decision to use back lighting is essentially a decision to create substantial shadow areas in the image. It is complemented by the decision not to use any fill light thereby keeping the shadows as deep as they are in the night scenes.

Lathrop used a ⅛ double fog filter for most of the scenes he shot for HAMMETT. The effect of the filter he says is very slight and perhaps not something the average viewer would even notice, but to his eye it "makes your blacks so that they don't just fall off too sharply. It kind of fades them together." A ⅛ double fog filter is the lightest in the series. Lathrop does not use anything heavier and even the ⅛ he will take off for day scenes where the light level is up.

Biroc on the other hand did not use any kind of filter on the camera. He generally worked with a 150fc key, did not push the film and shot at an aperture of f5 or f5.6. f4.5 for a day effect and f5 or f5.6 for a night effect. He prefers working at 150fc not only because it is the level to which he is accustomed, but also because he feels he has more control over the lighting. With a higher key light level he finds it easier to achieve the right balance between various areas in the scene by adjusting the relative levels of the lights he is using. The same adjustment on a lighting unit will make less of a difference relative to a 150fc key than it would relative to a 50fc key. Using a higher key has the effect of giving him more working space between fully lit and dead black in his scene. It also reduces the likelihood that spill light will affect the rendition of the shadow areas in the image. When shooting at a higher f stop, it takes a great deal more spill light in the shadow areas to cause them to register on film as anything other than black. As a result Biroc has little interest in the increased speed of the new negative. All it will do is to enable him

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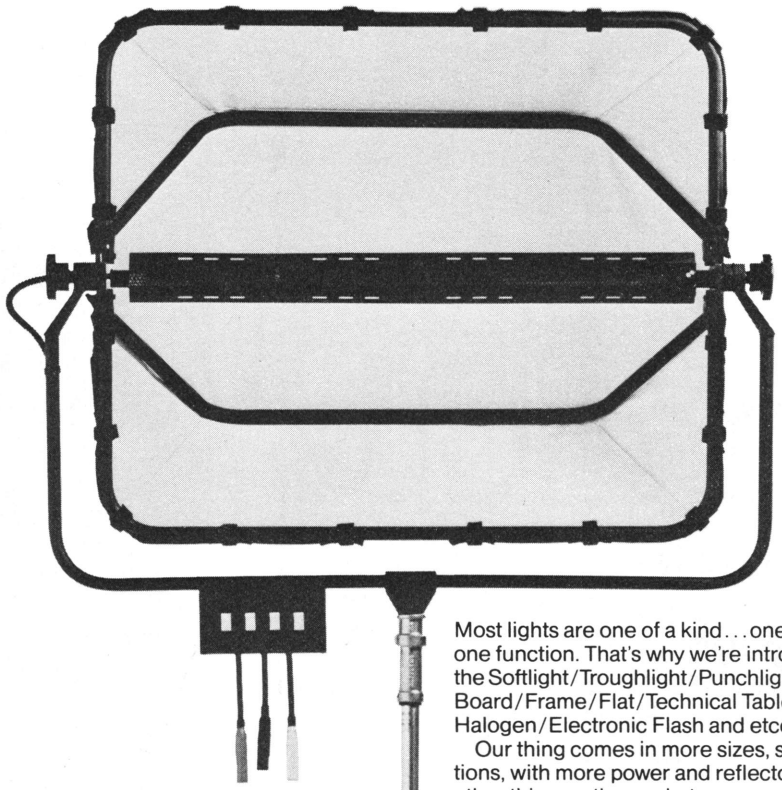

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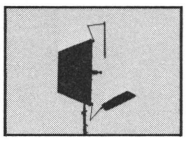

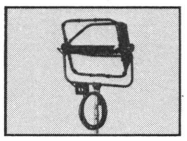

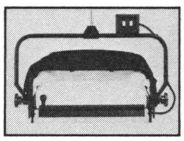

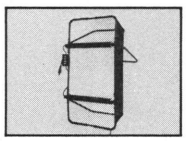

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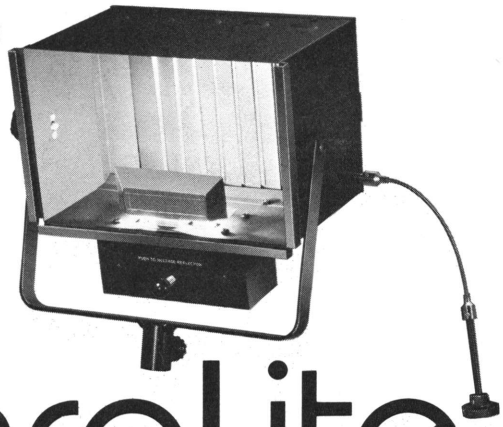

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Biroc will lower the level of the key light on a character that is secondary to the main point of the scene to perhaps half key and he also takes into consideration the color of the actor's skin. The point is to design the lighting so that the eye goes immediately to the principal character. Both Biroc and Lathrop will set the lights for the principals first and then light the rest of the set using individual lights for specific areas. Biroc may be inclined to use more lighting units than Lathrop would for a given scene since he rarely uses fill light, and seems less concerned in general with simplicity as a stylistic element.

Perhaps 20% of what Biroc shot for HAMMETT was photographed on location in San Francisco and Los Angeles, while everything Lathrop shot was filmed on the stage—even the street scenes. One particularly difficult location Biroc encountered was an apartment in Los Angeles which was used for all of Hagedorn's apartment except the bedroom. The scene with Hagedorn in the bathtub was photographed in the bathroom of the apartment and required concealing a lamp in the shower stall in order to light Hagedorn. In general, location lighting is apt to involve more compromises than studio lighting because of the limitations as to where the lights can be put, particularly how high up a light can be.

One aspect of his lighting that Biroc emphasized in discussing HAMMETT is his use of "break" on the walls behind an actor. When an actor is crosslit, the side which is in shadow will be separated from the wall behind him by means of a light on the wall. The light on the wall will be set so that the portion of the wall behind the illuminated side of the actor is darker than the actor. Thus the entire outline of the actor will be clearly delineated without the use of a back light on the actor.

Even though Biroc uses different working methods than Lathrop they were both able to achieve the same result. HAMMETT is a contemporary color film with a visual style reminiscent of the Thirties. Art direction and wardrobe play an important role in creating the look of a black-and-white film, but it is primarily the textures and shadows created by the lighting which make the film resemble the classics it seeks to emulate. ■

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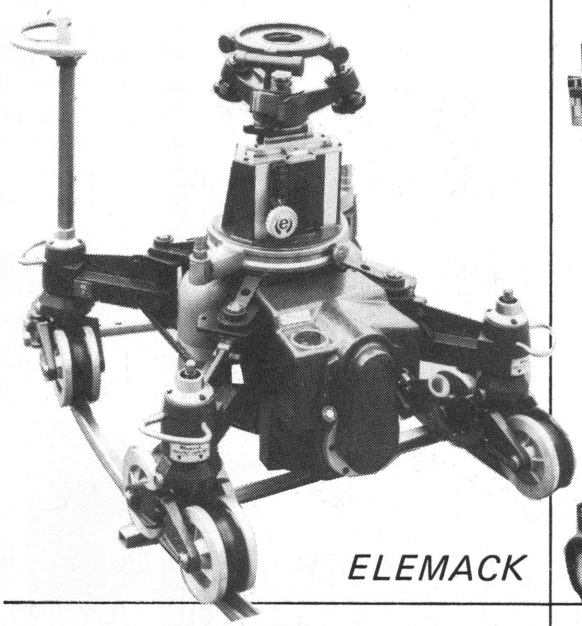

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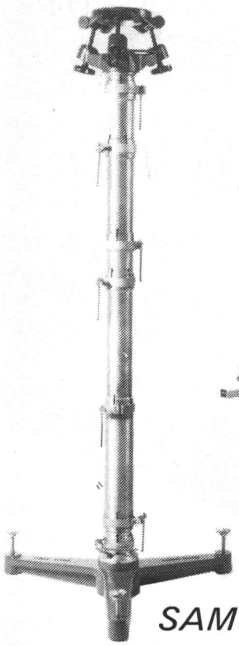

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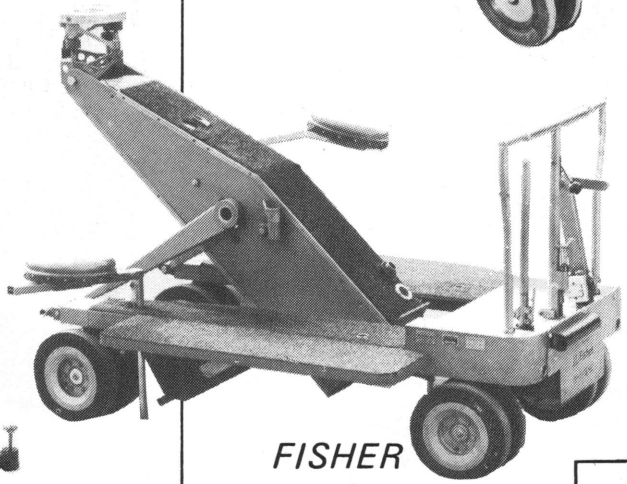

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and they laid down one section of track. The camera was placed at the first point and moved slowly forward and up as the shot moved toward the ice cream. The move looked good, my assistant got his focus marks and we were set.

But this is where the real challenge began. I turned and looked behind the camera as I finished riding through the rehearsal of the shot and I noticed every one of the agency people lined up like a queue for a pay telescope at Mount Rushmore. I asked the grip to park at first and locked the head in position and stepped down with my hand out like a porter waiting for a tip. They didn't give me one, nor did they laugh much, this was serious doings for them.

The director and I wandered to the coffee table as he muttered some insight about the Bushido code of agency decisions. This producer, I was reminded, was a new prospective client for the advertising agency who was embarking on TV promotions for the first time. They were setting a look for the entire campaign. As I looked back, viewer number twelve of fifteen was about to get his turn to look at the opening frame. There were two camps dividing the group like kids choosing sides for sandlot baseball. One group was gesturing vertically while the others were just as vehemently gesturing horizontally. "You know each one of those guys makes less in a week than your grip's best boy makes in two days, but they get to come here and fight for their job security as if they were the president of the company. And half of them got where they are by controlling the path of every penny in some account, which is what they should be doing now instead of playing with the artistic side of it. Each one of them feels he has to say 'no' to something he fought for and lost six months ago, so that he can say 'I told you so.' six months from now."

While the director railed on about the politics of commercials, we worked our way to the food stylist. We asked how the first Wellington was coming. She looked at one of the ovens and asked how they were going to make steam. They offered either, "A & B" acid, smoke from behind the cup, freshly boiled coffee, or a boiled bolt in the cup to keep it steaming. The director rejected the first two suggestions as looking too false, and real coffee steam as impractical. He felt the coffee was not featured so the boiling bolt would give us more takes and wouldn't detract from anything. So the props guys got some huge bolts from their box and put them on the stove to boil.

By this time the last of the agency had looked at the shot, and the two distinct groups awaited our return. We decided it was time to face the problem and move forward. As we approached, their voices grew louder and suddenly both factions vied for our attention to see their side of the issue. It seems one half wanted the napkin to be standing, the other wanted it to be lying at the side of the plate. My job usually doesn't call for much acting, this time they had me. I had to work to stifle a laugh. The director handled it much better. Without regard to who was on which side, he simply said, "We're selling dessert. The napkin should be folded low and laid at the side of the plate. Now, did you agree on the style of goblet for the ice cream yet?"

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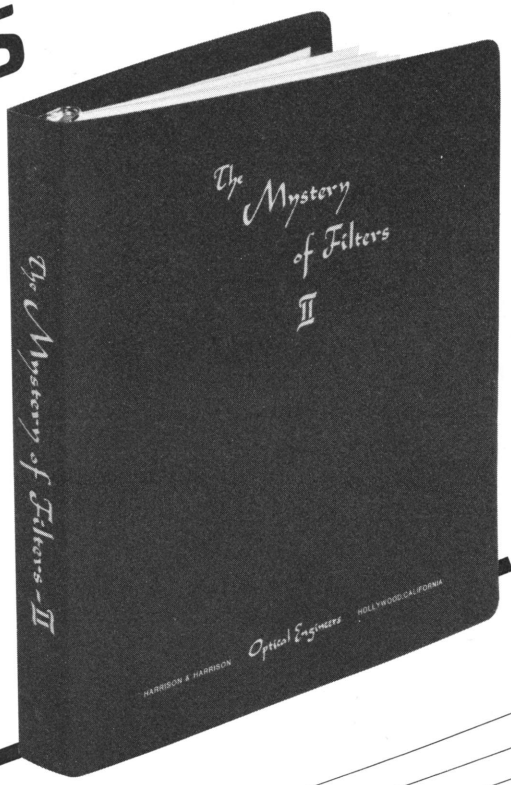

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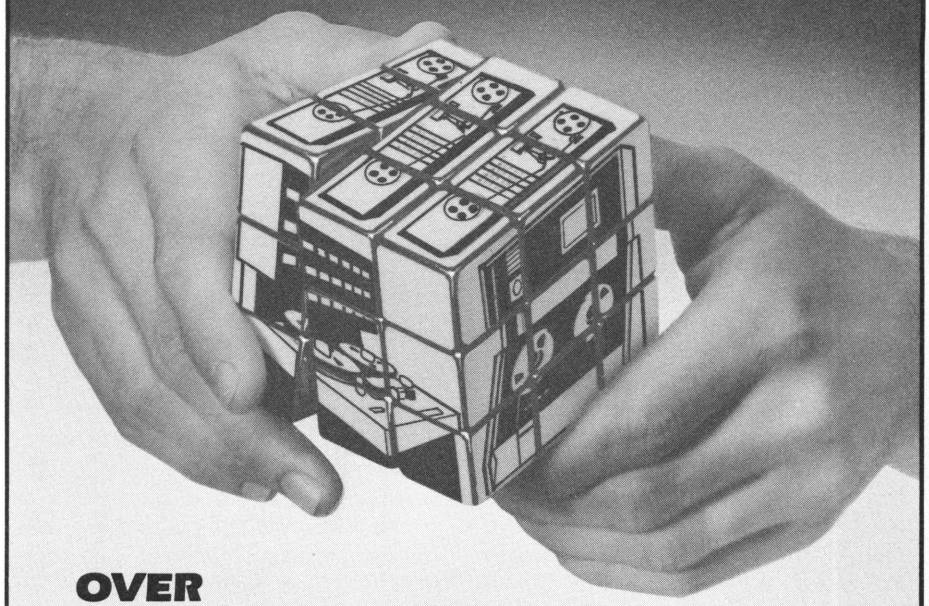
eagerly attacked it. As the propsman and his assistant unveiled each of the seven styles of antique goblets they'd brought, it was met with much chin stroking and less talk. Here too, factions quickly formed, some favored the simple pewter, or the sculpted silver, while others gravitated to the bold cut glass, or the delicately etched flowered glass and still others favored the tinted cut crystal with stylized etched flowers. I retired from the field to sneak a look at the manual for my new meter and sent my gaffer for another focal spot to accent whatever they chose. They finally settled on a graceful, but short multi-faceted cut crystal goblet with a fluted rim. As I added light to the back and saw it refract through the dish to sparkle below the ice cream, I felt it was not a bad choice. And I finally solved the riddle of the buttons on my calculator/light meter, only to find it resolved exactly to the f6.3 I'd gotten with my incident meter! Ah the marvels of technology.

They were happy, I was happy, the director was happy and our producer was ecstatic that we could finally move forward. The Wellington was medium to rare, so we cleaned the table and made ready for the "hero" set-up. The food stylist wheeled in the meat, which was carved slightly differently than our stand-in so we moved the hot spot in the foam core a few inches to adjust. We placed every item perfectly and made ready for the ice cream to be placed. The lights were dimmed, a fan was turned on to cool the set, a boiling bolt was held at the ready and I was sitting with my finger on the switch. The assistant director quipped, "I guess there's nothing holding us back but fear itself." This brought a chuckle from the group as the hero ice cream was gingerly placed on its mark. The props man asked if the shape was okay. I ran up the dimmer just enough to get a sense of it then quickly ran it back down. The bolt was lowered carefully into the coffee and along with steam, we got bubbles and hisses from the cup. Deftly the propsman lifted the cup, mopped the saucer and replaced the cup without wasting a gesture. We were ready to shoot. The camera rolled,—we dollied slowly into the table and all went well. Except, the dolly stopped a little earlier than I expected and my operating didn't. So we ran back to first. The ice cream wasn't quite as robust as at first, so the propsman offered to

Puzzled...



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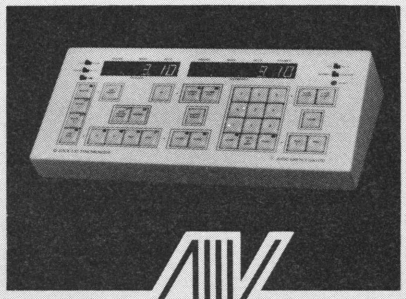

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spray it with freon to keep it from melting. He just feathered one gentle blast over it. We brought the lights up on the dimmer and rolled the camera and suddenly it was obvious. A slight but very noticable frost had formed on the edges of the scoop of ice cream. The preproduction meetings had never mentioned a frosty mountain of pure green chocolate chip ice cream. As we studied this, one drop escaped below the frosty crust and slid down the goblet to the paper. The goblet had been positioned exactingly so that no part of it was hidden by any part of the plate or saucer adjacent to it. Now this small spot was growing bigger in one of the few places where it couldn't be hidden. So, the medium to rare Wellington, the coffee with its boiling bolt and the perfect goblet had to be removed for the grip to pull down another piece of seamless paper and secure it to the table. We used a cutout piece of cardboard to find the exact place for the critical objects on the table. It was placed at the edge of the table and cut at two points touching the objects, then replaced with the new paper. This helped avoid any wasted time in resetting anything, the plates, the proper focus, or the dolly. With a set that is only a few inches across and deep, every little move is a major shift in the balance of the elements being photographed.

As they reset the table, something caught my eye. "That goblet wasn't sitting like that, was it? There's a hot spot on the front edge of the goblet. It's right at the edge of the ice cream. It's much brighter." My new meter to my eye, and sure enough it read an f22. "That wasn't there before. It's 4¼ stops over. It's distracting. My eye goes to it, not to the ice cream, and" with the meter again, "the asparagus needs just a touch more light." My assistant had an idea for the goblet. He waved his hand over the back of the dish and noticed that the glass was refracting the light through the inside, so he took his grease pencil and lightly marked the spot on the back which cut the light on the front of the glass. While he was doing that, my gaffer was coaxing a little more light onto the wilting asparagus. He finally got all he could, the stylist added a spritz of water and things looked pretty good. But as we studied the coffee it was looking more like tar than coffee, so it had to be replaced. While it was out, one of the agency noticed that the Wellington was starting to rainbow. Sure enough, the oil on the face of the carved Wellington was starting to show a full spectrum of color. The stylist was at the ready with a carving knife to do a little surgery. She shaved a neat quarter inch off to reveal a new layer that was every bit as tempting as the first. The lights were dimmed. The hero ice cream was brought in and we rolled camera, brought up the lights and socked take two away in the can. Everything still looked pretty good, so we went for a take three. The props man added a very light spray to the air just above the ice cream this time and we began a take four. But as the lights came up for this take, the ice cream was beginning to show a midriff bulge. It was past the point of being fresh and was beginning to show a shiny reflection from many of the areas that were just thinking about melting. I could hear a small rumble grow in the ranks of the agency, but lest we lose the moment, the director wisely called for the slate, the lights and we dollied. A half second after we cut one maverick drop escaped the goblet and landed on the seamless paper. By now the Wellington needed help and the asparagus was beyond it.

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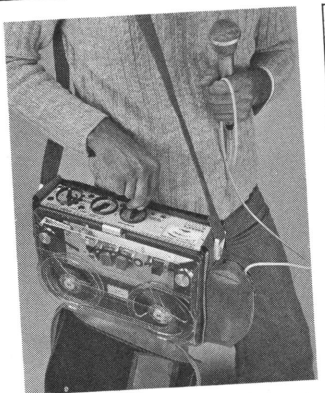

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This hub-bub from the agency included some "wow's" and "ohs" as they grew ecstatic over the "glowing mountain of green mint." It was just the moment before the ice cream actually melted that the strongest version of the color came forth and all the frost receded. This was what they wanted. But they got so excited over this "glow" (aka melting), that one faction developed which wanted to try seeing a scoop instead of the agreed upon two slabs leaning on one another. During all the preproduction meetings and in all the stills of their product it was shown as two leaning slabs, to change it now was a bold stroke. And the "Slabs" were quick to liken the scoop to Inky the bashful ghost in a Pac Man game. In spite of these derisions the "Scoops" held out for a change. I liked the change, but it was up to the director, who was already playing with the propsman's extra goblets and scoops. He stood back with his chin in hand and evaluated three different scoops, each from a different gadget and each slightly varied. To no one or to all of us who were looking over his shoulder, "You know the Old Masters would work a week on a bowl of fruit. They made careful decisions on what they would paint. This is no simple decision . . ." To more of his chin stroking, we all quietly waited. Then the propsman came over beside him, "Do you have a larger scoop?"

"Well, no, but one of the silver goblets is very small, let me try." The propsman replied as he was already in motion shaping a larger scoop from the lug of ice cream. It took the day. They all loved it, especially the seasoned pro from the agency and the representatives from the client. So it was agreed. We would shoot the large single scoop of ice cream just as it melted to capture the "glow" of green from this mountain of mint-chocolate chip.

So the dinner was rebuilt and shot another twenty or twenty-five takes until no doubt remained that we had at least two perfect takes. We then turned our attention to the greater challenge of that day. The pour shot. With only one small dish in the frame, it was possible to focus that much more attention on details. As the director pointed out, "The fewer items in the frame, the more we see of each one." What we saw before was merely the mountain range, what we were seeing now was each individual skier gliding between the chocolate chip trees.

The first take was set, I brought the foam core closer and had to cut it in half to get the best bounce angles for the two babies that were bounced onto the fill side. The trick was to get light into each nook and cranny of the mountain but with enough shading to keep the third dimension of the texture. By adjusting the basher to a kick angle, its light would highlight the crest but still wrap over the top and accent the front. My key grip added a double net to the black cutter that was creating a shadowed horizon. This gave a more gradual shift from the glow that was falling on the ice cream to the contrasting darkness that swept up behind it. To make the pour, our propsman presented a long-handled ladle. It allowed him to reach between the lights and foamcores and nets and flags to precisely place the warmed sauce along the prescribed path down the North face of this mountain. There was much discussion as to the undulations of the pouring sauce. It was finally agreed that it would start at the crest, pour down the camera left side, then cross the front, North, face at the rim, then pour its way back up the mountain. Believe me, it sounds much easier

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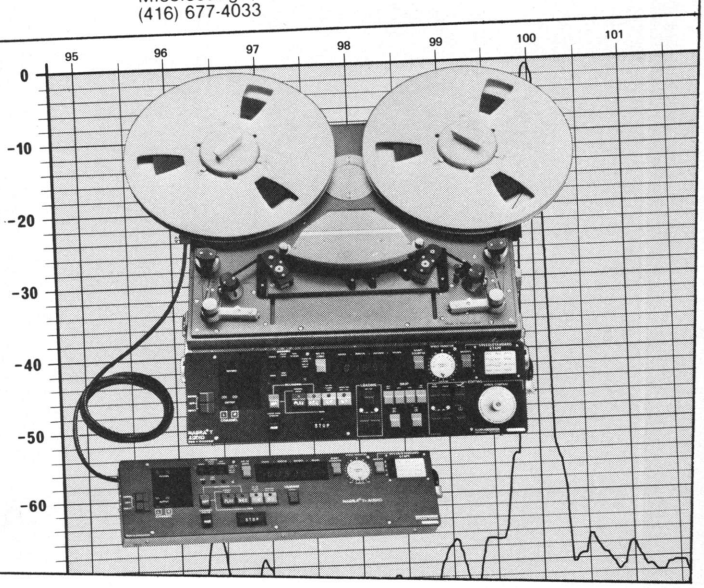

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than it was. Every take meant a new dish of ice cream, perfectly sculpted of course, the old dish had to be emptied, washed and rinsed in declorinated water, then quickly dried with a lint-free towel. As we got into the 15th take, I asked the grip's best boy to help with the washing to keep the assembly line going. Our food stylist was busy with keeping the vat of marshmallow topping at the best temperature for pouring and being sure the pearlescent quality was of the right consistency. With luck we only dripped on the paper four times, and my assistant held focus on almost every drop of the marshmallow glacier as it cascaded down the crest and into the valleys of the glowing mint mountain, past the chocolate chip trees as it filled to the rim of the sparkling crystaline goblet. By the end of the day the agency was elated that we were achieving true art with our work. As we shook hands and parted I was happy for their kind words, but I would hold my opinion until the kicking and screaming subsided at dailies and I knew we'd mastered the beast. When some ask why we would go this far, I can only answer, "Because its there." ■

Ric Waite
Continued from page 1135

ing down a couple of cop killers. But they've only got 48 hours to do it. It is a movie filled with night exteriors and a few, dark interiors. Ric Waite is shooting almost the whole movie with available light supplemented by ordinary 100, 60, or 25 watt household bulbs. He is shooting 5293 and rating it at 750 to 800 without forcing. He is printing at 33 and 34. He can look you in the eye and tell you he feels comfortable shooting in as little as five foot candles.

He described one sequence that involved the heroes, in a Cadillac convertible, chasing a bus that has been stolen by the bad guys. It takes place at night. Downtown Los Angeles, Olive between 9th and 3rd, doubles for San Francisco. "If I had to shoot that on 47, had to light it, I could nominally light maybe two city blocks, maybe three. But you just simply cannot cable beyond that. I think it would have gone twelve nights of work. We did it in four. We actually put doubles underneath the (practical) fluorescents in the center of the bus to take 'em down! I did use one 60 watt bulb on a thing hanging out of the side of the bus; we did tie-in shots over the

shoulder from inside the bus through a broken window. So, there was like a 60 watt bulb. Other than that, this whole long shot was photographed with available light—you could see from 9th or 3rd damn near to Santa Monica! I mean it's just incredible." A look at a rough cut of dailies shows Waite is not exaggerating; it looks incredible. It'll be interesting to see if his blacks stay solid through the master-positive/dupe-negative cycle and make it to release prints without going milky. But based on the dailies this may be one of the first depictions of a street scene at night that looks like a street at night and not like a movie.

"I tell my gaffer," Waite says, "our next picture, whatever it is, is going to be midgets and babies and that's it. We don't need seniors and juniors and 10k's, other than maybe, if I have to do a big night sequence of the desert or something, where there is no available light. I think it's going to revolutionize the way movies are shot. A lot of cameramen don't have the courage that I do, and I don't say that as a horn tooter. But a lot of cameramen are either coming from 100 foot candles and they like it that way, or they like big deep stops, or they're afraid to shoot wide open, or they may not have the budget to afford high speed lenses and the sophisticated stuff that has to go with it to make it all work. But for those of us who are not afraid to shoot 1.5, 1.3, 1.1, 1.7; or are not afraid to shoot at three foot candles, it's there. If you can see it with your human eye, anywhere at all; in a dark closet; if you can see it with your eye, I'll get it on film. And that's just the way I'm lighting. And literally, I'm using seven and one half watt bulbs, in some places. Nick got up to a wall in one shot, and I had a seven and a half watt bulb in there—incredible! It is so fast, and the resolution is so high. It's just what the industry needed."

Waite laughs when he talks about Kodak's factory rating of A.S.A. 250. "It's ludicrous. I mean, they (Kodak) even laugh." I asked Waite why, in his view, Kodak would so vastly underrate its own, new stock. "Well," he mused, "they're a big, conservative company. Maybe they're just afraid to say, hey, guys, this is A.S.A. 800; and somebody goes out and shoots at 800 but doesn't really shoot it right and says, God, I've got blank film and the picture is a disaster and they're in big trouble. They (Kodak) don't want

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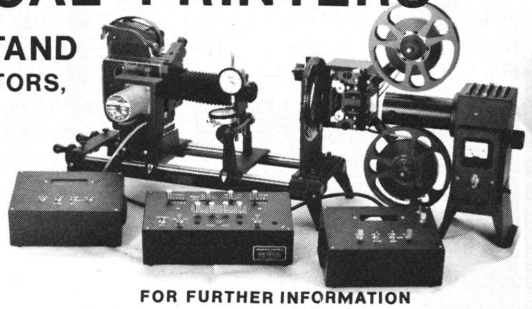

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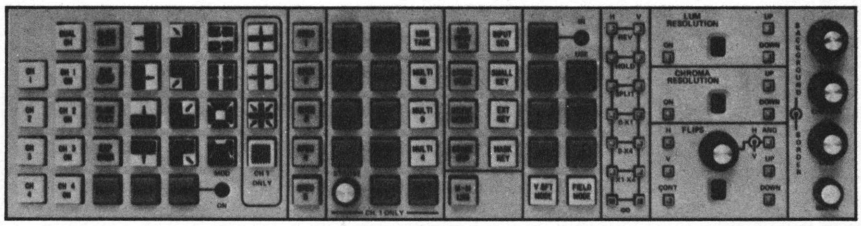

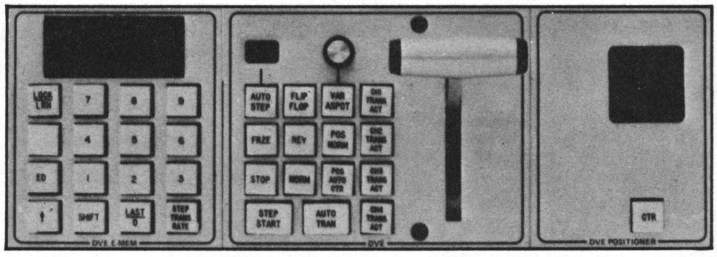

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to be liable or responsible and make rash statements. I think, probably in a year they'll readjust that and make it A.S.A. 600, and they'll probably give you a little footnote that says this is conservative. Because it really depends upon how you light. One thing that you do need is light in the shadows. Not very much. I'm using seven and a half watt bulbs, ten watt bulbs . . . I'll light the set, and then when I'm all through, I'll usually hang a 60 watt bulb someplace where it doesn't show. And that just puts enough light into the shadows, where you don't get milky, and it just gives a nice, rich black. You must do that, where you're on the edge, with that low a light level."

Is Waite at all concerned with the low color temperature of the household bulbs he was using? The answer is no. "I like it warm anyway," he said, "I don't mind. The lab can fix all that without even half trying."

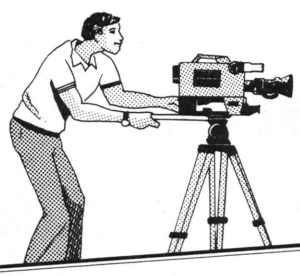
Of course, shooting wide open does present a problem to the assistant. How is it kept in focus when, depending on the lens, as little as an inch is actually sharp? "I've got the two best focus pullers I think, that Hollywood has to offer: Baird Steptoe and Richard Walden and I've raised them like my own sons. I've had them with me, off and on, for eight or nine years. They are incredible. I can't say how they do it. So much of this is violent action; it's not just a love story; so the movements are very abrupt. There's a whole lot of stuff in dailies that is fuzzy. You just cut around it. Again, I can't say enough for my director, because he understands that. He can cope with that. We do so many takes and so many angles."

In 48 HRS., the problem of keeping it sharp is compounded by a stylistic choice. Waite and Hill decided to shoot the film, to the maximum extent possible, with long lenses. "Because," Waite explains, "it has a lot of energy in and of itself. It forces the audience's eye where you want it and partly because it's just simply a look. There's been long lens shots in pictures for years, but (this is) a picture that has been conceived with that kind of frame in mind." Waite's long-lens approach would have been quite impossible without the remarkable speed he is getting out of this new film.

Ironically, Waite came very close to shooting 48 HRS. on Fuji's new high speed stock. "Originally, I was told that nobody could get over 40 or 50 thousand feet of the new Kodak stock. So, I let it out I'm gonna shoot the whole picture on Fuji, and I had Walter's blessings on it. It's a nice stock. I did a lot of exhaustive tests side by side. You would have to see them side by side to read the difference. But there's a difference. Kodak gives better blacks and better shadow detail. But you wouldn't know it if you didn't see them side by side.

"Anyhow, I let the word out that I was going to shoot a major motion picture with Fuji. And I would have. The word got back to Kodak. Somehow, miraculously, Fred Gottlieb (L.A. head of Kodak) got hold of Les Shorr (head of the camera department at Paramount) and said 'Hey, wait a minute, I can guarantee Ric 300,000 feet of film.' Actually, we're gonna go about 450,000 feet of the high speed stock."

Ask Ric Waite about Kodak's new 5293 and he'll tell you a lot of very good things. He is a true believer. ■



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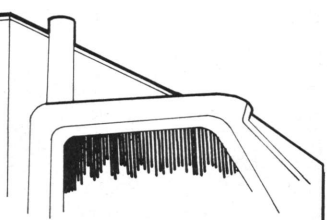

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Lighting for 5293
Continued from page 1135

In this scene, Veronica Hamill and Dan Travanti are in a hot tub. It's an interior night scene with no natural illumination. Cronjager placed a big candle on either side of the tub and augmented that source light with five to eight footcandles coming from two midgets. That simulated moonlight. No fill light was used. Then, the cinematographer did a sweeping pan and picked up all the details over the entire scene just the way the human eye would see them at night.

To achieve this effect, Cronjager rated Eastman high speed color negative film 5293 for an equivalent exposure index of "around" 1500 which included a one-stop "push." The decision to push the film was consistent with the methods used for creating a stylized look which distinguishes the show.

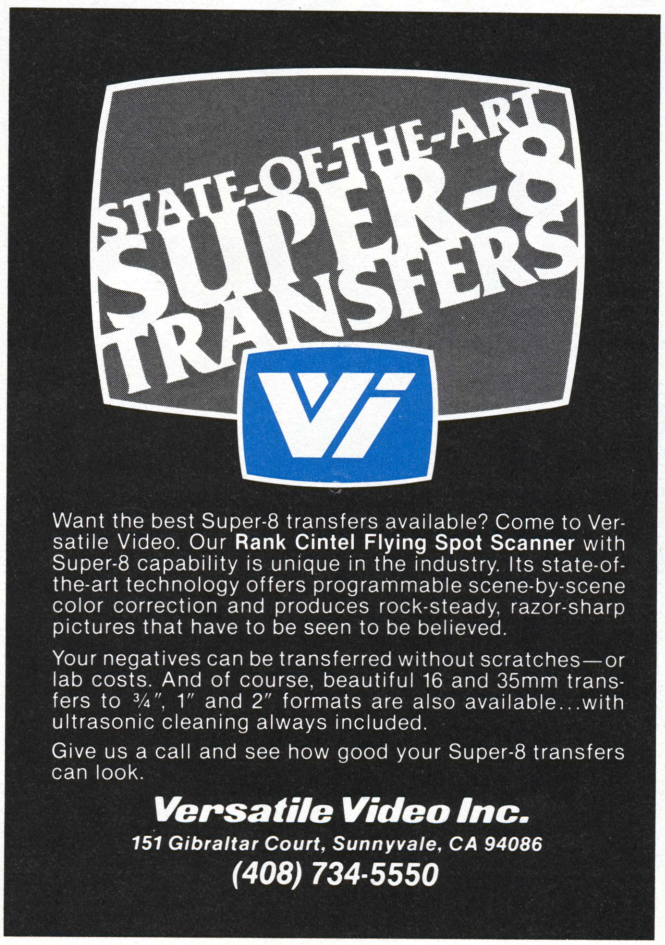
Cronjager believes that the high-speed emulsion is going to make routine things which were formerly difficult, time-consuming and often costly to achieve. "We can now go any place to shoot a film with little more equipment than a camera," he says.

"You can do practically anything you want," Cronjager continues. "In some situations, we were down to practically nothing as far as illumination goes. And yet, the details were there on the film after it was processed. I treated the high-speed emulsion exactly the same way that I handled Eastman color negative II film 5247 on this show. The only difference was that I was typically rating one emulsion for an exposure index of 200 by pushing it one stop and the other for an E.I. of 1500."

In another situation, Cronjager was shooting a night exterior on a long, dimly lit street. The director wanted to hold the background. Cronjager used only three to five footcandles to light the foreground, and reports that details all down the street were crisp, and the blacks held.

In a third situation, he was shooting a sequence in a dark, multi-storied slum tenement. Cronjager lit the foreground with three to five footcandles and relied on natural light to illuminate the backgrounds. There were two dividends: time was saved shooting the scene, and it looked more realistic.

Alric (Al) Edens, ASC, first used the high-speed emulsion when the producers of "Private Benjamin" decided to broaden the story line and



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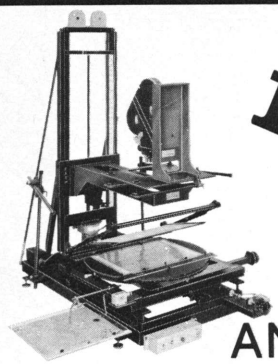

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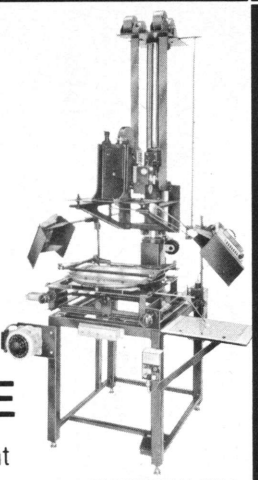

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establish a more interesting look by using practical locations for the last five episodes of the season. Day and night exteriors were filmed at locations ranging from a church to a disco.

Edens acquired between 20,000 and 25,000 feet of the high-speed emulsion to film key scenes. These were all situations where it would have been impractical or impossible to take time to light for a slower emulsion. "Private Benjamin" works on a four-day shooting schedule. During the last five episodes, two days were spent on the lot and two at practical locations.

After testing the high-speed emulsion, Edens decided to rate it for an exposure index of 600 for interiors and night scenes and 320 in daylight to reduce the size and number of lighting elements without sacrificing image quality. One scene was filmed at a supermarket. Edens sent an electrician in advance of the crew to check overhead lighting fixtures. Most of the ambient light in the store came from eight-foot long fluorescents. Most of these were replaced to assure even lighting.

Edens wanted the ambiance at eye level so faces could be seen clearly even on long shots. He used two fey lights, one on either side of the action, and a panel light mounted on front of a Panaflex camera. And that was it.

"If we had had more lights we would have generated more heat, which probably would have required shorter takes so we could fix makeup," he observes. There was also a night exterior shot in which a character gets out of a taxi in the foreground. A long residential street is behind him. A group of extras are placed some 50 to 75 feet in the background. Edens used a single arc to light the foreground.

"I couldn't believe my own eyes when I saw the dailies," he says. "Everything was in sharp focus. You could read the extras clearly in the background. And the colors were true. One of the things that the latitude of this film does is provide an opportunity to work at the best T-stops, which gives us tremendous depth-of-field."

The biggest test came during the production of an episode about a crooked disco operator. Edens used the high-speed emulsion to shoot a night exterior at the entrance, a scene staged in a dimly lit office, and another in the disco itself. The disco was

75 to 80 feet wide and 50 to 60 feet across. Dancers occupied the dimly-lit floor, and characters lounged in the background at a dark oakwood bar while a glistening mirror ball rotated amidst flashing colored and strobe lights.

Edens used a star filter to heighten the effect of the mirror ball. Because of the hot kickback from the ball, the cinematographer had to scrim his lights. The scene was exposed by ambient light augmented by a few carefully placed small units. Edens was working with a wide lens, which would have made it difficult to find time and places to hide larger units.

Even so, because of the high film speed, he was able to work at stop T-4.5 which allowed him to carry the entire room in focus.

"The high-speed film really probes into the shadow areas," Edens notes. "We picked up details which would have been lost unless we had time to light much more precisely."

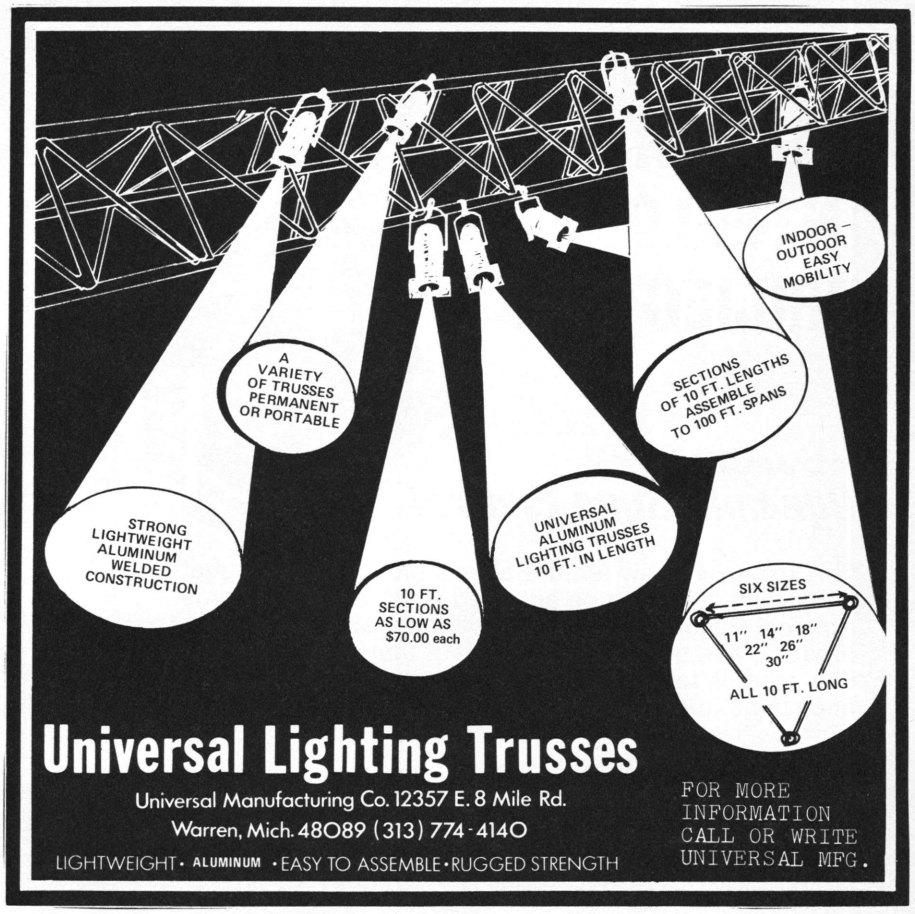
The same scenario is being played out on the theatrical film side of the production industry. During the days immediately following the introduction of the high-speed emulsion, cinematographers working on features where there were unique requirements for film speed used the 5293 stock to meet special challenges.

Jim Crabe, ASC, used the high-speed emulsion to shoot several night exteriors while filming New York locations for NIGHT SHIFT. He rated the film for an E.I. of "around" 400. In one night scene, the camera was put on a highboy and pointed out of the back window of a speeding station wagon. Crabe was working with a hard lens set at a T-stop of 1.5 or 2.3. The only light was ambient. The scene looked great.

Bill Butler, ASC, shot about 10 percent of STING II with Eastman high speed color negative film 5293. Butler determined his exposure index for the new film by establishing a mid-range printing light at Technicolor Labs.

Butler established a printing light of 26 at an E.I. of 750 with 200 percent of shutter. The cinematographer rated the film 2½-stops faster than Eastman color negative II film 5247, which he used for the rest of the picture.

In one situation, he used the high-speed emulsion in three Panaflex-X cameras to film a night exterior on a moving roller coaster at an amusement park in Santa Cruz, California. One of the cameras was on a two-shot and each of the others was



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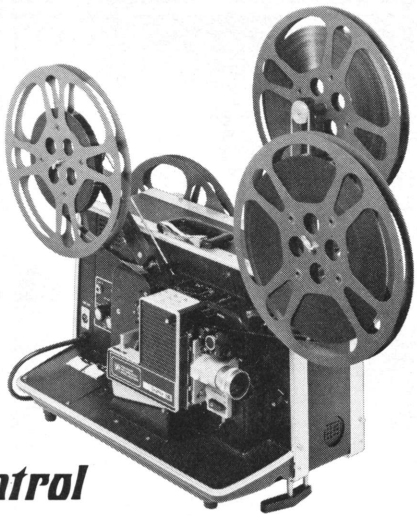

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focused on one of the two individuals in the scene.

The cinematographer had 1.9 super-speed lenses on the cameras, however because of the latitude of the film, he was able to work at stop T-2.5. This was important because he wanted to carry some depth-of-field. As for lighting, there were chase lights on the coasters, which are part of the visual illusion of the ride. If these weren't blinking, Butler says they would have provided enough illumination to have exposed the film. As a supplement, he hung 100 watt bulbs on zipcord at about 10 foot intervals. They fit right into the scene.

Light readings varied from eight to 16 footcandles. The higher reading came when two cars passed. "The film held up beautifully," says Butler, "and we got excellent depth-of-field."

In another situation, Butler filmed a night car chase which carried over three blocks of watered down streets entirely with ambient light. The E.I. was 750, and Butler estimates that there were approximately two footcandles of ambient light.

"(The film) bit into the shadow areas and showed every detail," he says. "And there was no burn-out or flaring even when the headlights were coming right into the camera lens."

In a third situation, Butler was shooting a backlot sequence staged in a Chinese marketplace. It was scheduled to be shot with the 5247 emulsion; however, by the time the scene was set up and ready to shoot, it was already turning dark. Instead of folding up for the day, and restaging the same sequence later, Butler was able to film by switching to the "hotter" emulsion.

"It seems to me that we can open up backgrounds considerably," he says. "By reducing lighting in the foreground, you create an illusion of having a brighter background. When combined with a high-speed emulsion which is capable of biting into the shadow areas many things become possible."

Another Butler observation: while it is apparent that in many instances, cinematographers will be working with fewer and smaller lighting units, the potential time-savings can be translated into improved production values as well as reduced costs. "I look at a new film like this as being a new tool for the cinematographer," he says. "More accurately, it is more like a new kind of paint. I don't think that anyone can predict with total ac-

curacy all of the things that are likely to happen when you put a new paint like this into the hands of so many different cinematographers.''

The high-speed emulsion is being used in a variety of ways by different directors of photography working on different films. For example, while he was shooting TOOTSIE, in New York, Owen Roizman, ASC, opted to use the film at an E.I. of 250 while working at a 38 print light.

The cinematographer used considerable diffusion to create a softer look for the film's main characters. However, even though he was shooting through anamorphic lenses, Roizman was still able to use fairly high T-stops, T-3.2, 3.6 and 4, while placing comparatively small lights, such as Inkies and 2Ks, to amplify sources.

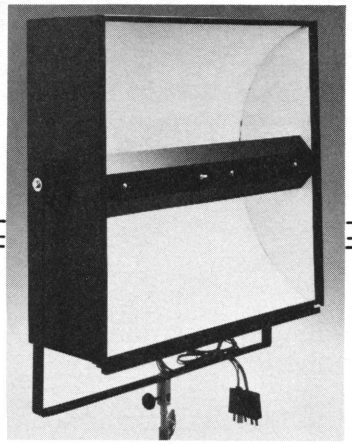
Among the reasons why the latter was important: Dustin Hoffman's part called for the use of extremely heavy make-up. More lighting would have generated more heat which could have caused the make-up to melt.

By mid to late 1982, the high-speed emulsion was being used in formats ranging from 16 mm to 65 mm. For MAGIC JOURNEYS, a 16-minute 3-D film produced by Walt Disney Studios for display at the Epcot Center, the new Disney World showcase in Florida, Eastman high speed color negative film 5293 in the 65mm format helped to simplify shooting a very difficult scene. Production throughout the making of this unique motion picture was done at very high T-stops, often T-16 or T-22, because of the need to project an extremely sharp image. That sometimes required working with as much as 6,000 foot-candles of light.

The high speed film was used to film a carousel sequence shot at Disneyland, in Anaheim. The scene had to be lit from every angle, 360 degrees. Yet, there were only two days to complete shooting.

By using the high-speed emulsion, and rating it for an E.I. of 400, director Murray Lerner was able to substantially trim the number and sizes of lighting elements needed. He credits this with saving critically needed production time.

The fast film has been very valuable for documentary and soft news photographers. They can travel lighter, move faster and work less obtrusively because of the latitude of the film. PBS producers, who normally work either in the 16 mm format or with electronic field production



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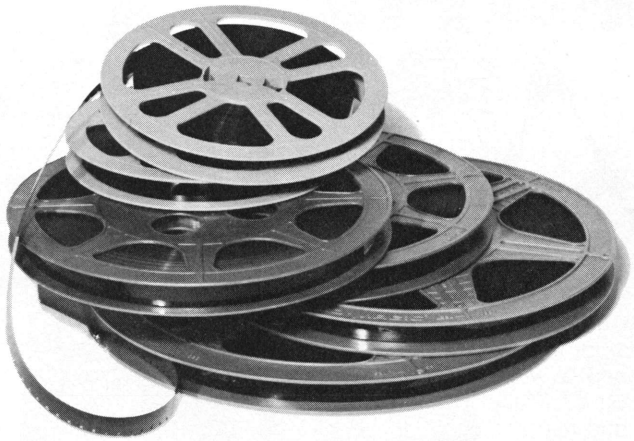

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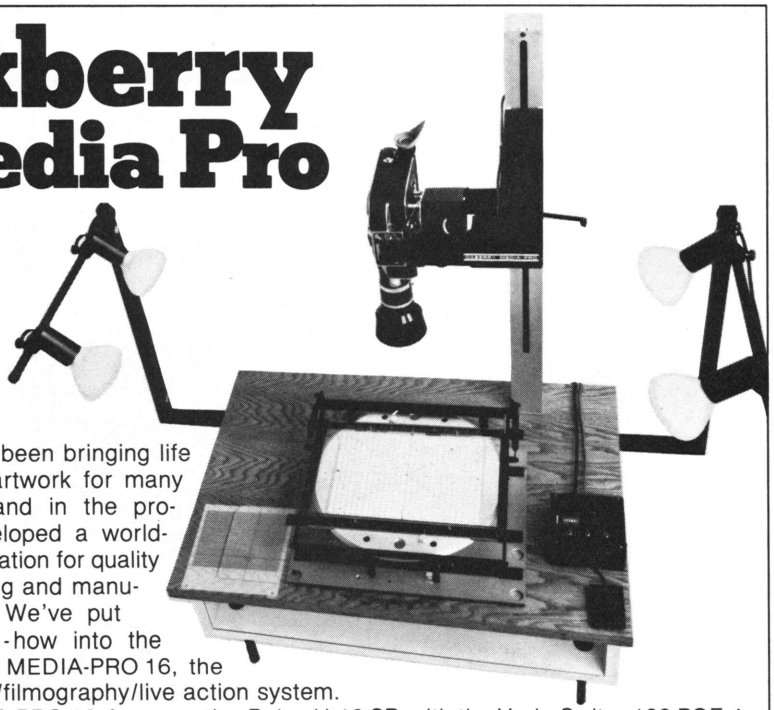

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(EFP) equipment, are also finding that the fast film provides considerable creative flexibility.

For example, South Carolina Educational Television (SCETV) is currently originating much of 1776, an historical drama for PBS, on the high-speed emulsion, which they rate for an E.I. of 500. The film speed allows maximum use of ambient light. The producers are shooting scenes which would have been impossible to light before the availability of the high-speed film.

The "Andy Williams Early New England Christmas Show" for CBS Television was originated entirely with a mix of Eastman color negative II film 7247 and Eastman high speed color negative film 7293. Some 30,000 feet of the high-speed 16 mm emulsion, rated for an E.I. of 250, was used in situations where source lighting provided the main illumination.

In the field of commercial production, Sid Avery offers some thoughts on how the high-speed negative is making exciting new lighting concepts feasible. "We were shooting a campaign for Young and Rubicam. The scene called for us to shoot a Lincoln Mercury car coming out of a lush black background past high fashion models on either side of the road into a warm red sunset. The whole feeling said luxury," Avery says. "This is the kind of a scene that you shoot on a sound stage where you can create and control the look you want. Otherwise, you end up limiting production to 45-minutes a day, hoping that the weather cooperates and the look is constant."

Avery created a sunset in his studio using a 300-foot long cyc made of painted muslin 36 feet high. To add to the illusion, high fashion pictures were taken of models at the Avery studio, in Los Angeles, and these were made into six-foot high silhouettes. He achieved the quality of light he wanted by bouncing light off the painted walls from cyc strips placed at ground level. He wanted to work at a T-stop of around 4.5 or 5.

"That's just sharp enough to render the details you want people to see," he says. "If you go to a higher stop, you lose that romantic look. It's too sharp. There's more detail than you want the eye to perceive." Avery was using an Arri BL camera with a Cooke 5:1 zoom lens ("I like the way it resolves in this kind of a situation," he says).

Avery needed more light. "I didn't

want to push the film (5247) because I wanted the blacks to be as lush and as rich as possible,'' he says. ''I didn't think that using a hard lens was the solution either. When you are shooting a spot commercial like this, you need to be able to zoom from a full scene to a closeup on the grill, for example, in just a few seconds.''

A possible alternative was a technique that Avery helped to pioneer: Hanging sail cloth over the scene and bringing soft light through it. However, Avery knew it would be impossible to do that without getting a very slight but discernible milky reflection on the windshield. He wanted the ambiance to be ''black'' with no light coming from above. And he wanted the windshields clear.

The answer: ''That was about the time when the 5293 emulsion was introduced,'' Avery replies. ''After testing, I decided that we could rate the high-speed emulsion for an E.I. of 320. The spot came off beautifully. We didn't use any fill on the shadow side of the cyc. The film saw right into the shadows. As the car drove into the red sunset that we painted, our silhouettes dissolved into the high fashion models we had photographed, and they walked up to the car, which stood beautifully silhouetted against that red sunset. The blacks held perfectly. It was exactly the mood we wanted.''

It's a technique that Avery has since applied to different spots in different ways. However, his point is well-taken. ''I believe that what is significant here is that the new film has allowed us to develop a new concept for lighting to achieve a specific mood or visual feeling,'' he says.

For the last word about how the new high-speed film is affecting lighting techniques and methods for TV commercial production, we turned to Roger Flint, who recently earned the CLIO award given for cinematography. He made this comment: ''We used this emulsion recently on a series of commercials, and we got a beautiful image with much less light. People are still doing a great deal of experimenting, but what it will come down to is an enhanced ability to be more subtle. We will have fewer and smaller lights, which will allow us to cover bigger areas. We are going to have to start thinking about how this will eventually affect context as well as methods of production.'' ■

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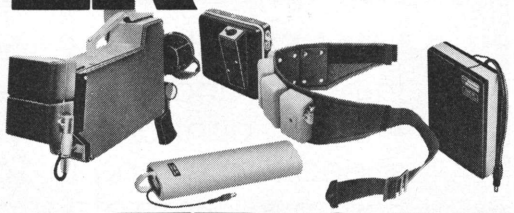

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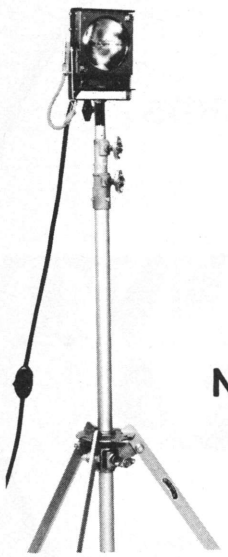

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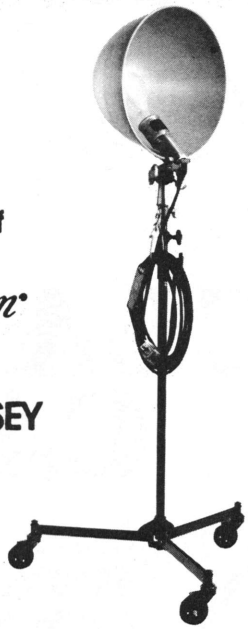

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Continued from page 1125

light sources that were compact and linear and that had high power density. In this particular application alone, we were already well into the second generation of basic designs.

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The current "revolution" going on in the entertainment lighting field relates to the continuing growth in the application of the enclosed arc A.C. discharge lamps, commonly referred to as HMI, CSI and CID. (The term HMI appears to be taking on generic characteristics, and for the balance of this article, this family of lamp types may be referred to as "HMI type" lamps. The term HMI actually belongs to Osram of West Germany.)

The HMI lamp was first introduced for an entertainment industry application by German Osram in 1969, and was specifically developed at the request of the West German television organization. They were looking for a high output, compact source of daylight for use in location situations. For some time the HMI source was applied only in television and in both France and West Germany it became the primary source utilized in outside broadcast applications (remotes or locations). Use of the HMI source in motion picture applications remained limited for several years.

One of the problems that troubled film people was the time-varying characteristic of the light output of these lamps. To put it simply, the light output of the HMI lamp varies during each half cycle of the A.C. power applied. If the peak output is considered to be 100%, the valley associated with this time varying event is only about 18% of the peak. The concomitant of this phenomena is the possibility of encountering "flicker" where there is a lack of synchronism between the power line frequency and the camera framing rate. The introduction of the crystal controlled camera motor in the late Sixties, with its more widespread application in the early Seventies, made the utilization of the HMI source much easier. It

became clear that if the lamp was powered from the power net of any of the developed countries, and the camera had crystal control of the framing rate, then there was no problem with flicker. The location people were the ones to seize on this new family of very high performance lamps first, and they typically are using the power net. Where a 575 or a 1200 watt source could be powered from a baseboard outlet, a crystal controlled motor on the camera was all that was needed to allow utilization of HMI, without fear about flicker problems.

Latterly, crystal controlled generator plants have been built in some numbers to provide reliable sources of A.C. power for HMI lamps on location. In addition, there are available a variety of instruments that permit direct and simple measurement of the frequency of the power system by looking directly at the output of the lighting instrument.

Certainly, at this time, it is safe to say that HMI type lamps are taking their place in the motion picture production field, and particularly on location.

DISCHARGE LAMPS?

The most recent influence in the field has been the activities of the ILC organization of Sunnyvale, California. In addition to having created a full range of HMI lamps, except for one 200 watt model, they have led the way in bringing out the first 6,000 watt daylight lamps and are still the only manufacturer of a 3,200° Kelvin HMI type lamp.

The 6,000 watt lamps have stirred the most energetic responses on the part of all of the major lighting fixture manufacturers. It is beyond memory when a development in the light source field brought forth such efforts on the part of the fixture makers. The result has been the instantaneous availability of a range of lighting instruments for this lamp that give the user an interesting range of choices. At last, *there is a range of lighting instruments to choose from that can match and supersede the performance of the long standard 225 ampere "brute" D.C. arc.*

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requires an electrical input of 27,000 watts D.C., and the HMI does not require an operator! The information in the hands of the writer indicates that this is clearly the biggest success of a new lighting system in some time. The power ratio of almost 3.9:1 of course speaks for itself.

Where the 6,000 watt unit is used from 220 volts, it becomes even more interesting, since the input cable size is quite moderate for a current rating of approximately 32 amps! Imagine, brute performance for 64 amps at 120 or only about 32 amps at 220 volts. The advantages are so obvious that they really need no further elaboration. Surely, the cost management of a major location feature requires consideration of these lighting systems. Whatever special considerations there are associated with using HMI are not any longer very significant. With some understanding of those potential pitfalls, there is no reason not to use these powerful, highly efficient sources, with complete assurance of trouble-free results.

3200°K COMES TO HMI

Another very significant development from ILC has been the creation of the first and only 3200°K HMI type light sources. The best part about these lamps is that their efficacy remains in the same range as the daylight types. That is to say, over 90 lumens/watt for these sources with a color rendering index of 90 or better. The significance of this performance is that they approach 3½ times the light output of incandescent lamps at the same power.

The lamps developed are in the same wattage modules, and have the same electrical characteristics as the daylight versions. Since they are also mechanically interchangeable, it becomes possible to operate lighting systems in either daylight or 3200°K situations by simply interchanging the lamp. In either instance, the efficiency of the system need not be compromised by the use of conversion filters. These lamps are currently available in 575 and 1200 watt modules.

FLICKER

Simply stated, the problem of the A.C. arc lamps is encompassed in the term A.C. (alternating current). As seen in the accompanying figure, the voltage rises to a peak, descends through zero to a negative peak and back to zero to complete one cycle of

alteration. For 60 cycle (or 60 hertz) systems, this cycle is repeated 60 times each second. Reference to the same figures shows that the light output of the HMI rises to a peak and descends to within 18% of the value of that peak during a *half cycle.* During one full cycle of alteration of the current, two lighting peaks are experienced. Clearly, these peaks are in synchronism with the alterations of the current wave form.

The problem is related to the fact that if we assume a camera is operating at 24 FPS, during each framing interval there are five lighting peaks occurring if the light is driven from a 60 cycle source. That is to say, based on 60 cycle power there would be 120 lighting peaks per second and 120 divided by 24 equals five. So far, so good. In European practice where 25 frame cameras are utilized for television filming, the power tends to be 50 cycles which means 100 lighting peaks per second at 24 frames so that there are 4 lighting peaks per second in this system.

It should be easy to visualize that as long as the number of variations in light output and the shutter action remain in synchronism, there should be no tendency to have any variation in exposure (which is really what the flicker phenomenon is). It really doesn't matter in the course of exposing the film whether there are five, four or 2 7/32 variations per shutter opening as long as there are always that number for each shutter opening. This is the reason that when using a very stable power net such as would be available in a city like Hollywood or any of the major cities in the developed countries of the world, and a crystal controlled motor on the camera, this synchronism is maintained and there should be no flicker problem experienced. Literally millions of feet of film have been exposed under these conditions without difficulty.

It turns out, that on more careful examination there are shutter angles which minimize the tendency towards this problem even if there should be slight shifts in the power-line frequency. For 60 hertz operation the most practical value of shutter opening for those cameras which have variable shutters, is 144 degrees. Tests have been made in which the power line frequency was allowed to vary continuously from 58 to 62 cycles while the camera was operating crystal controlled at 24 frames. With the 144 degree shutter opening no

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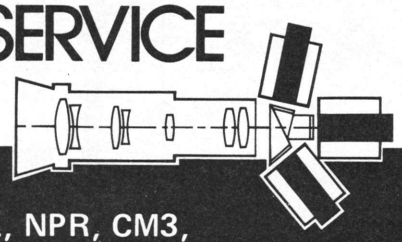

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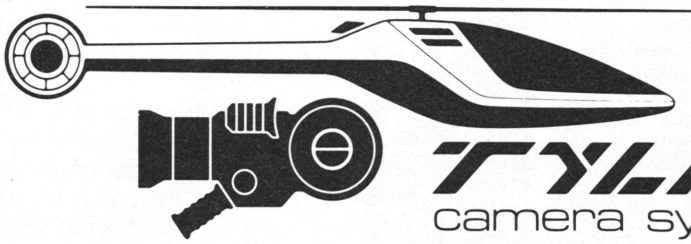

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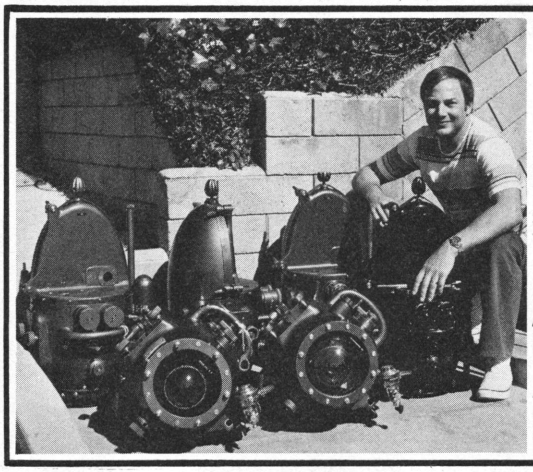

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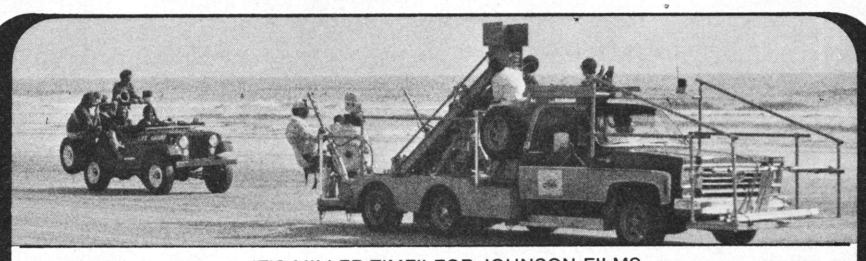

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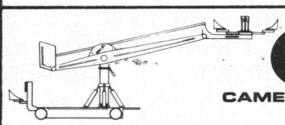

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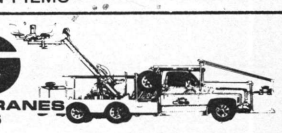

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flicker was experienced. This is only true at this particular point, and for 180° shutters on 24 frame systems with 60 cycle power to the lights, only a very small variation in frequency can be tolerated.

For operation on 50 cycle power the ideal shutter angle is 180°. One would expect the same tolerance as expressed above for the 144 degree case at 60 cycles and 24 frames to apply here.

There is a well known chart available which has been reproduced on a number of occasions and is the 5th edition of the American Cinematographer Manual. This shows the windows of safest operation for HMI for the various frequencies. These curves were developed by the BBC research department.

When operating from portable generators, it is highly advisable to stay with the 144° shutter angle whenever possible. Even in the case of the "crystal controlled" generating plans which are now available, any significant change in load during a shot could cause a pulsation that might be noted before the generator control system could correct for the imbalance. It is well, when working with a portable generating system, to have in hand one of the several devices which can be utilized for actually reading the frequency by simply holding them in front of the light. It is possible to continuously monitor the lights during a shot under these circumstances without interfering with the action, and ensure oneself that the variation has been small enough so that it should not cause any difficulty.

There has been talk for a number of years now about flicker-free ballast systems. Except for one device which was extremely heavy, none of the electronic systems that had been put forward are in regular field use except for the 200 watt systems. There have been heated announcements and much excitement on various occasions when some equipment has been put forward for the 575 and 1200 watt lamps (and in one case for 2500's) but in none of these instances has the unit proven to be field-reliable. Certainly this is a problem capable of solution, and it is to be hoped that such a solution is put forward in the near future. A concomitant of the solution which may limit its application even if it arrives soon, may be the cost. These systems are already quite expensive, and the use of an electronic power system to overcome the flicker problem will certainly be substantially higher in cost than the iron core devices being utilized in the present ballasts.

Incidentally, only film has been dealt with in this section and that is because the flicker problem is nonexistent for television use. Due to the persistence of the system, there is no need to be concerned about the time varying characteristics of the light output when using video systems.

COLOR CONSISTENCY

The concern with color consistency relates to the fact that the HMI type lamps as manufactured have a color temperature tolerance. As taken from the box, brand new, an HMI lamp is rated to be 5600°K plus or minus 400 degrees. What this means is that if you take two brand new lamps out of the boxes to be used side by side in fixtures, one can quite legitimately be at 5200° Kelvin and the other 6000°. In fill light applications this is probably not too crucial, but where multiple keys are used in the scene the differences may become evident in wide shots which are picking up all the lighted areas. Certainly in a number of television applications this has turned out to be a problem.

The situation is further complicated when new and old lamps are mixed. The aging characteristics of these lamps are such that the color temperature reduces with age. Perfectly operating lamps have been observed as low as 4600° Kelvin after long use. So long as the lamp is capable of a stable operating arc, and can be ignited satisfactorily using standard equipment, it should be possible to continue using it and it is certainly desirable to do so based on the first cost of these lamps.

The answer to this family of problems is to have adequate color measuring equipment in hand when using these sources. The most recent device encountered, and the easiest to use, is the Minolta Color Meter II. This device is push-button operated, reads out in Kelvin directly on a digital scale, and also by pressing a button tells you how many mireds of filter shift are required in order to correct the source back to the reference temperature (the reference color temperature can be set for 3200 or for daylight).

This brings the user face to face with the dreaded mired. As with many other legendary dragons, the mired

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turns out to be rather helpful and pleasant to deal with rather than a fearsome and difficult monster. The mired value is simply a way of expressing Kelvin temperature in a form that permits you to add and subtract numbers to determine the correct amount of filtering for a given situation. For every Kelvin temperature there is a mired value obtained by dividing the Kelvin number into one million.

Every conversion type filter (that is filters which shift the color temperature) are described as having a *mired shift value.* Using the mired shift value and knowing the mired value for the initial source color temperature, it is possible to very quickly predict the effect of the filter on a source at any color temperature.

This particular system has been promoted on a number of occasions in the USA, with only limited acceptance. The problem, seems to the writer to be a computational one. It simply seems to be too much trouble and yet it is a most convenient way to deal with filters. As is well known, the same filter applied to a source at 3000° or 3200° Kelvin and then to a source that is close to daylight has a very diverse effect in terms of the amount of color temperature shift produced. This is completely predictable with the mired system, and further allows the mired shift values of several filters to be simply added or subtracted in order to find out what the final effect is.

Finally, there is a simple way to deal with this value, and to take full advantage of the simplicity and accuracy of prediction that is possible with it. This is using a conversion filter selector slide rule produced by Rosco Laboratories. There are only two scales on the slide rule, and it is only necessary to set the desired Kelvin temperature number opposite the source Kelvin temperature number and then read out the mired shift value. On the back of the slide rule is a list of the various conversion filters and their mired shift values. It is simply necessary here to select the filter closest to the value desired and apply it to the light. Additionally, all of the conversion values of the Wratten filters have also been printed on the rule, so that it is possible to deal in Wratten equivalents, or in mired values.

If the combination of the Minolta Color Meter II and the Rosco conversion filter selector slide rule is utilized, the problems of balancing up variety

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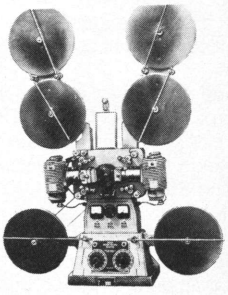

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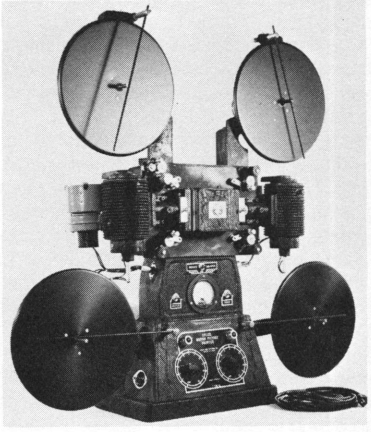

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Title of publication: AMERICAN CINEMATOGRAPHER.
Date of Filing: October 6, 1982
Frequency of issue: Monthly. Annual subscription price: $20.00.
Number of issues published annually: 12.
Location of known office of publication: 1782 N. Orange Dr., Los Angeles, CA 90028.
Location of the headquarters or general business offices of the publishers: Same as above.
Names and addresses of Publisher: A.S.C. Holding Corp., 1782 N. Orange Dr., Los Angeles, CA 90028; Editor: Richard Patterson, 1782 N. Orange Dr., Los Angeles, CA 90028; and Managing Editor: None.
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I certify that the statements made by me above are correct and complete. Richard Patterson, Editor.

of HMI or other similar types of arc lamps, so that at least the key lights can be at the same color, becomes a very simple task to accomplish.

SAFETY CONSIDERATIONS

This is a subject that has been mentioned before, and recently brought forward again with the general view of safety concerns in film production practices in Hollywood. As is usually the case, the concerns come forward after a serious accident. The voltages associated with the operation of HMI type lights are significantly higher than usual for motion picture lighting practices, particularly in the USA. In the case of the higher wattage HMI's, the operation approaches 400 volts, for open circuit conditions, and the operating voltages are in the neighborhood of 200 volts. These are considered to be potentially lethal levels of voltage. All of the equipment presently being manufactured for the HMI source, have carefully designed and tested grounding systems included. This independent third wire mechanical ground must be respected in the use of this equipment.

CONCLUSIONS

The arrival of the 6KW HMI type lamp finally means there is an economical and functional alternative to the D.C. carbon arc brute. There are convenient, simple to use means for reliably dealing with all of the problems that have been associated with the use of HMI type sources in film production. A wide range of Fresnel spotlight and other equipment utilizing these sources is in the marketplace, offering options of small, ultra-lightweight and portable up to more conventional sizes and weights. Metering equipment to monitor power line frequency at the light is readily available to assure that there are no flicker problems; the Minolta color temperature meter in conjunction with the Rosco conversion filter selector slide rule make color balancing a simple operation.

As long as the safety provisions incorporated in the HMI systems utilized, in particular the grounding (earthing) arrangements, there are no reasons not to take advantage of the features of this efficient high performance lighting equipment. ■

Richard Glickman is a consulting engineer and an associate member of the A.S.C.

American Cinematographer

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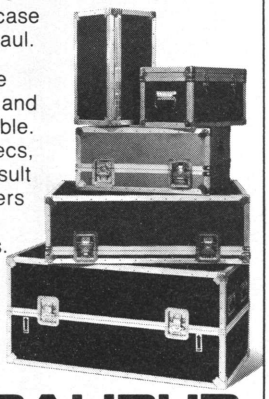

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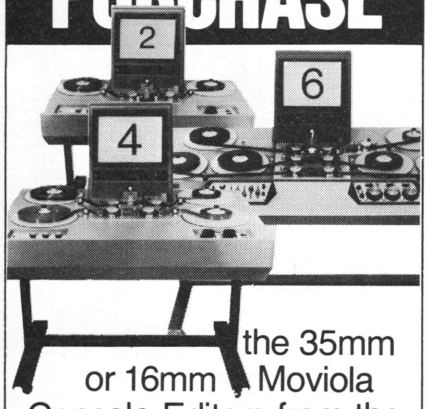

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Gregg Toland

Continued from page 1148

and the revival theaters could ever have been controversial, so completely has its style been absorbed into the mainstream of film making. Its startling transitions and eccentric camera angles seem smooth and realistic when compared to the jump-cutting, fast zooming cinematography of many films of the past two decades. The lighting effects that once seemed extreme have long since been basic to the so-called *film noir* style which came to fore during the mid-Forties. Yet the initial showings of the film brought hostile reactions from many viewers. Theater owners were plagued by walkouts and refund demands.

The basic photographic style of CITIZEN KANE is one of extremely deep focus, a technique Toland called "pan-focus." There had been earlier examples of the principle, most notably in the 1931 Fox production, TRANSATLANTIC, photographed by James Wong Howe, ASC. Toland, who had more sophisticated tools at his disposal, was able to carry the technique to even more startling extremes.

"During recent years a great deal has been said and written about the new technical and artistic possibilities offered by such developments as coated lenses, super-fast films and the use of lower-proportioned and partially ceiled sets," Toland wrote in AMERICAN CINEMATOGRAPHER for February 1941. "Some cinematographers have had, as I did in one or two productions filmed during the past year, opportunities to make a few cautious, tentative experiments with utilizing these technical innovations to produce improved photo-dramatic results. Those of us who have, I am sure, have felt as I did that they were on the track of something really significant, and wished that instead of using them conservatively for a scene here or a sequence there, they could experiment free-handedly with them throughout an entire production.

"In the course of my last assignment, . . . CITIZEN KANE, the opportunity for such large-scale experiment came to me. In fact, it was forced upon me, for in order to bring the picture to the screen as both producer-director Welles and I saw it, we were forced to make radical departures from conventional practice . . .

"CITIZEN KANE is by no means a conventional, run-of-the-mill movie. Its keynote is realism. As we worked together over the script and the final,

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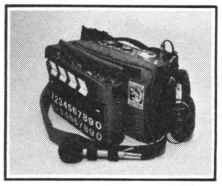

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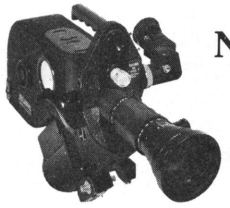

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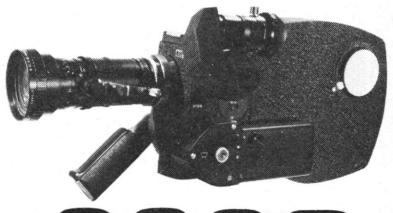

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pre-production planning, both Welles and I felt this, and felt that if it was possible, the picture should be brought to the screen in such a way that the audience would feel it was looking at reality, rather than merely at a movie.

"Closely interrelated with this concept were two perplexing cinetechnical problems. In the first place, the settings for this production were designed to play a definite role in the picture-one as vital as any player's characterization. They were more than mere backgrounds: they helped trace the rise and fall of the central character.

"Secondly—but by no means of secondary importance—was Welles' concept of the visual flow of the picture. He instinctively grasped a point which many other far more experienced directors and producers never comprehend: that the scenes and sequences should flow together so smoothly that the audience would not be conscious of the mechanics of picture-making . . .

"Therefore, from the moment the production began to take shape in script form, everything was planned with reference to what the camera could bring to the eyes of the audience. Direct cuts, we felt, were something that should be avoided wherever possible. Instead, we tried to plan action so that the camera could pan or dolly from one angle to another whenever this type of treatment was desirable. In other scenes, we pre-planned our angles and compositions so that action which ordinarily would be shown in direct cuts would be shown in a single, longer scene—often one in which important action might take place simultaneously in widely-separated points in extreme foreground and background.

"These unconventional set-ups, it can readily be seen, impose unsurmountable difficulties in the path of strictly conventional methods of camerawork . . . they simply cannot be done by conventional means. But they were a basic part of CITIZEN KANE and they *had* to be done."

Alfred S. Keller, ASC remembers visiting the KANE sets at the RKO-Pathé Studio and was surprised at their unorthodox construction. "Some of them were built on parallels instead of on the floor of the stage. They could take up sections of the flooring and set the cameras at floor level or below."

With much of the picture being photographed from low angles, ceilinged sets were a necessity. Toland said that, "In almost any real-life room, we are always to some degree conscious of the

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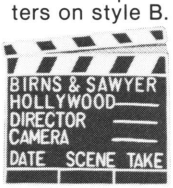

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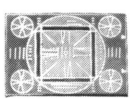

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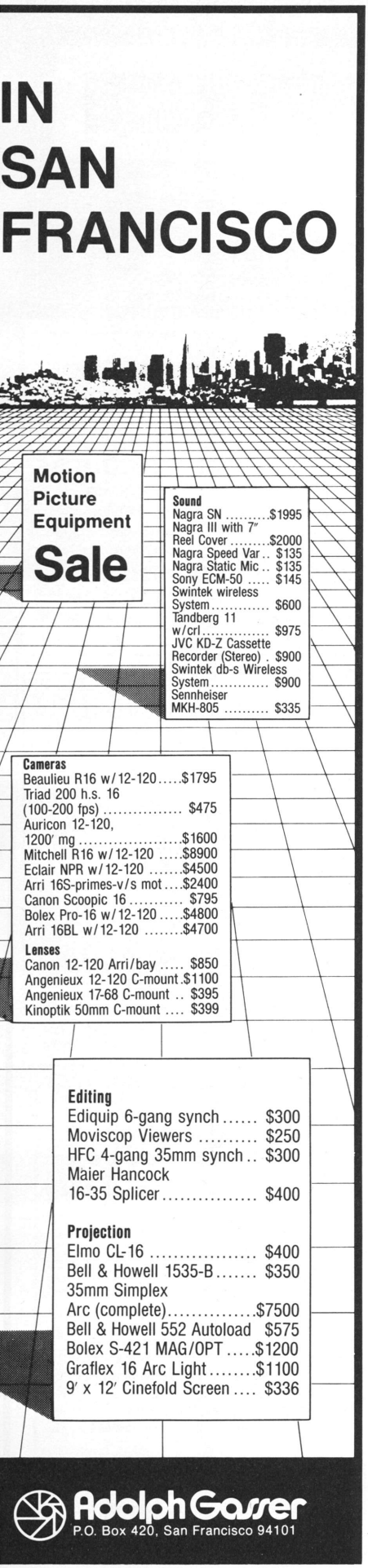

ceiling. In most movies, on the other hand, we see the ceiling only in extreme long-shots—and then it is usually painted in as a matte-shot. In the closer angles, the camera seldom shows the ceiling, or even anything suggesting it. On the contrary, conventional interior lighting effects, since the light is projected from spotlighting units perched high on the lamp rails paralleling the sets, come from angles which would be definitely impossible in an actual, ceiled room . . .

"Furthermore, many of our camera angles were planned for unusually low camera-setups, so that we could shoot upward and take advantage of the more realistic effect of those ceilings . . . Not one of the 110 sets was paralleled for overhead lighting. With the exception of a few occasional shots for which we could remove a small section of ceiling to permit using a junior or similar spotlight overhead for really necessary backlighting, everything in the picture was . . . lighted from the floor.

"With deep sets, this necessitated the use of light (with) great penetrating power. This was found in the twin-arc broadsides developed for use in Technicolor. These lamps formed the backbone of our lighting, supplemented of course with juniors, seniors and 170-amp. arc spots . . ."

The ceilings were made of muslin, which made it possible for the sound men to place their mikes *above* the ceilings, which, in Toland's words, "eliminated that perpetual bane of the cinematographer—microphone shadows!

"The next problem was to obtain the definition and depth necessary to Welles' conception of the picture. While the human eye is not literally a universal-focus optical instrument, its depth of field is so great, and its focus-changes so completely automatic that for all practical purposes it is a perfect universal-focus lens.

"In a motion picture, on the other hand, especially in interior scenes filmed at the large apertures commonly employed, there are inevitable limitations. Even with the 24mm lenses used for extreme wide-angle effects, the depth of field—especially at the focal settings most frequently used in studio work (on the average picture, between 8 and 10 feet for the great majority of shots)—is very small. Of course, audiences have become accustomed to seeing things this way on the screen, with a single point of perfect focus, and everything falling off with greater or

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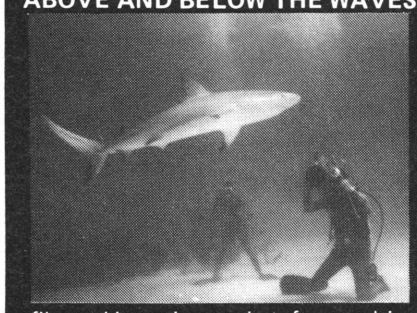

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less rapidity in front of and behind this particular point. But it is a little note of conventionalized artificiality which bespeaks the mechanics and limitations of photography . . .

"Now it is well known that the use of lenses of short focal length tends in itself to increase the depth of field. So, to, does stopping down the lens.

"Since the introduction of today's high-speed emulsions, some photographers and some studios make it a practice to take advantage of the film's speed by stopping their lenses down to apertures as low as f:3.5 or thereabouts when filming interiors . . .

"To solve our problem, we decided to carry this idea a step farther. If using a high-speed film like Plus-X and stopping down to f:3.5 gave a desirable increase in definition, wouldn't it—for our purpose, at least—be a still better idea to employ a super-speed emulsion like Super-XX and stop down even further? . . .

"The next step inevitably was to stop down to whatever point might give us the desired depth of field in any given scene, compensating for the decreased exposure-values by increasing the illumination level."

Toland credited the use of lenses treated with the Vard Opticoat nonglare coating and the use of arc broadsides as the basic lighting equipment with making it possible to photograph interiors at f.8, f.11 and f.16. At these apertures, ". . . the standard 50mm and 47mm objectives . . . have tremendous depth of field . . . Wide-angle lenses such as the 35mm, 28mm and 24mm objectves . . . become to all intents and purposes universal-focus lenses."

An unusual innovation achieved through lighting was the transitional lap-dissolves, in which the backgrounds dissolved *before* the players in the foreground did. "This is done quite simply, by having the lighting on set and people rigged through separate dimmers," Toland explained. "Then all that is necessary is to commence the dissolve by dimming the background lights, effectually fading out on it, and then dimming the lights on the people, to produce the fade on them. The fade-in is made the same way, fading in the lighting on the set first, and then the lighting on the players."

Toland said that Welles was "one of the most cooperative artists with whom it has been my privilege to work. He let down all bars on originality of photographic effects and angles and I believe the results have fully justified that policy. Photographing

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CITIZEN KANE was indeed the most exciting professional adventure of my career." Ironically, there were no further Welles-Toland collaborations.

Toland's next assignment, Goldwyn's THE LITTLE FOXES (1941) rivals KANE for dramatic pictorialism, combining the hard-etched pan—focus technique with an almost lacy elegance. "My work began six weeks before we shot the first scene," Toland said. "There were long conferences with the producer, with William Wyler, the director, with the architect who designed the sets, with the property man and other artisans.

"Discussions with the director involved a complete breakdown of the script, scene by scene, with an eye to the photographic approach, considering the various dramatic effects desired. While this advance discussion pertained to the art ingredient, it was also of economic benefit because it meant the saving of much time and money once actual photography began.

"We built knock-down minature models of the most important sets and juggled the walls about for the purpose of fixing upon the best angles, the best places to set up the camera. We took into consideration color values, types of wallpaper or background finishes, the color and styles of costumes to be worn by the principals, the furnishings and investiture. We set the photographic key for various sequences—the light ones, dramatically speaking, in a high key of light, the more sombre or moody scenes in a low and more 'contrasty' key.

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"Other conferences had to do purely with the economic phase. It was discovered that certain sets could be entirely eliminated because their importance to the dramatic whole did not justify their cost. Time being the costliest item in movie-making, a cameraman must consider it his duty to save all the time he can. If he can set up in 15 minutes instead of a half hour, so

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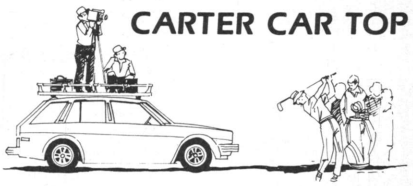

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His next for Goldwyn, BALL OF FIRE, (1941) was a sudden change of pace. a rambunctious farce directed by Howard Hawks, it made excellent use of contrasting lighting effects in depicting the razzle-dazzle world of a strip-danseuse (Barbara Stanwyck) and the staid, cramped milieu of her unlikely lover, a university researcher (Gary Cooper). Toland later said that in many ways BALL OF FIRE was the most difficult assignment of his career.

Nearly a year before the Japanese attack on Pearl Harbor, John Ford, who held a USNR commission, organized a volunteer Navy Photographic Unit of cinematographers, film editors and technicians. The first two volunteers were Toland and Joseph August, ASC. Nights and Sundays each cinematographer trained separate groups of six to eight men in the varous skills they would need as Navy cameramen.

The unit was called to Washington on active duty within a few days after the Pearl Harbor debacle of December 7, 1941. Lt. Toland was sent to Hawaii to make a full motion picture report of the Japanese attack. The result was a feature-length film, directed and photographed by Toland, called DECEMBER 7TH. Because of the secret nature of much of the film, it could not be released to the public. In 1943 a carefully edited two-reel condensation was released theatrically. It won an Academy Award as Best Documentary Short Subject.

Returning to Washington, Toland worked in the training program and co-designed a special combat camera. Later, he was sent to Brazil, where he produced Navy and OSS documentaries.

He returned to the Goldwyn Studio in 1945 to make a Danny Kaye musical comedy in Technicolor, THE KID FROM BROOKLYN. Although color photography had improved tremendously since his work with the two-color process of a decade earlier, Toland remained loyal to black and white as a dramatic medium.

"Color will continue to be improved but will never be a hundred per cent successful," he wrote. "Nor will it ever fully replace black and white film because of the inflexibility of light in color photography and the consequent sacrifice of dramatic contrasts. Anything done in the gay, high-light which color photography necessitates for its existence (such as musical comedies) will continue to be suitable as a subject for color film. But the low-key, more

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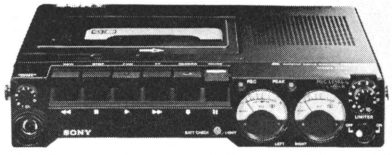

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dramatic use of light seems to me automatically to rule color out in pictures of another type.

"Paradoxically enough, realism suffers in the color medium. The sky, as reproduced, is many shades deeper than its natural blue. The faces of the characters are usually a straw shade. Three prime colors are utilized but not enough shades are possible with those three. More basic colors would involve too complex a problem to be economically practicable. In the black and white picture, color is automatically supplied by the imagination of the spectator and the imagination is infallible, always supplying exactly the right shade. That is something physical science will continue to find tough competition."

However, THE KID FROM BROOKLYN had its compensations. One of the gorgeous "Goldwyn Girls" in the film, Virginia Thorpe, became Mrs. Toland. The marriage took place at Nogales on December 9, 1945.

On loan to Walt Disney, Toland photographed one of the most beautiful of all Technicolor films, SONG OF THE SOUTH (1946). The live action photography was combined with animated cartoons of Joel Chandler Harris' Uncle Remus characters to brilliant effect.

He returned to his black and white pan-focus technique for Goldwyn's THE BEST YEARS OF OUR LIVES (1946), his most celebrated picture since KANE. Toland said he wanted the photography to appear "honest" with no striving for unusual effects and "chi-chi." This story of returning veterans won Goldwyn the Irving G. Thalberg Memorial Award, brought Oscars to director William Wyler, scenarist Robert E. Sherwood, film editor Daniel Mandell, composer Hugo Friedhofer, actors Fredric March and Harold Russell (Russell also received a second special award), and won the Best Picture award. Toland did not receive a nomination.

THE BISHOP'S WIFE (1947), a comedy-fantasy with Cary Grant, Loretta Young and David Niven, is a slick black and white production with beautiful snow scenes. A SONG IS BORN (1947), Howard Hawks' remake of BALL OF FIRE as a Danny Kaye special, again proved that Toland handled color well even though he didn't entirely approve. Included are the low-key effects he earlier had said were not practical for color—expertly done, needless to say. ENCHANTMENT (1948) is a romantic story photographed in a subtle, sometimes impressionistic black and

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white.

In April of 1948 Toland went to London for six weeks to shoot background plates for a project he never completed, TAKE THREE TENSES, from a story by Rumer Godden. Late in September he went on location in the mountains near Sonora, California, for preliminary work on Goldwyn's ROSEANNA McCOY. He returned to his West Hollywood home on a Saturday complaining of feeling tired. He rested at home for two days, then died suddenly on September 28 of a coronary attack. He was 44.

Toland's contract with Goldwyn, signed in 1926, was still in force at the time of his death. It had afforded him greater freedom over a longer period of time than has been given any other cinematographer. Behind his melancholy countenance surged a great joy in his work.

"Of all the people who make up a movie production unit," Toland once said, "the cameraman is the only one who can call himself a free soul." ■

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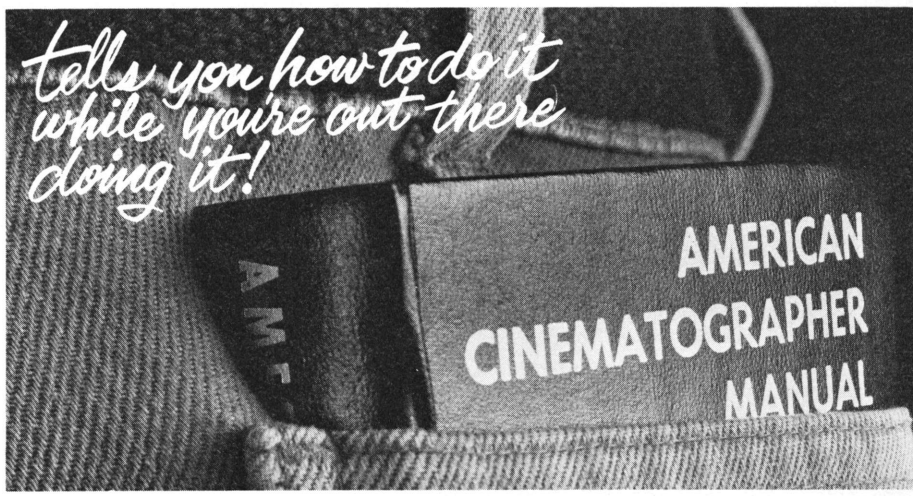

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